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THE

JOURNAL

OF

THE PHOTOGRAPHIC SOCIETY

OF

LONDON.

CONTAINING

THE TRANSACTIONS OF THE SOCIETY,

AND A

GENERAL RECORD OF PHOTOGRAPHIC ART AND SCIENCE.

EDITED BY

HUGH W. DIAMOND, M.D., F.S.A.

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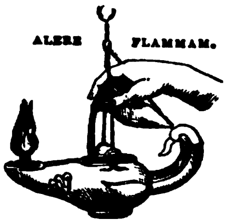
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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 143. MARCH 15, 1864.

PHOTOGRAPHIC SOCIETY.

The next Ordinary Meeting of the Session will take place at King's College, on Tuesday, April 5th, at eight o'clock, when Mr. Swan, of Newcastle, will detail his New Carbon Process.

Meetings of the Society, 1864.

Tuesday,	April	5
„	May	3
„	June	7

PHOTOGRAPHIC EXHIBITION.

The Photographic Society of London will open their Tenth Exhibition of Photographs about the middle of May next, in the Gallery of the Society of Female Artists, 48 Pall Mall. The Exhibition will remain open until the second week in August.

I. The Exhibition will be restricted to Members of the Society, with the following exceptions:—

1. Those wishing to exhibit may do so on becoming Honorary Members for the term of the Exhibition being open, on the payment of a fee of one guinea.
2. Foreigners may exhibit, free from any other restriction than that their contribution shall be approved of by the Committee of Selection.

II. Every description of picture will be received which is the result of the photographic art alone; but pictures from painted or touched negatives, and also touched and painted positives, will not be exhibited. A duplicate picture (unmounted), for the use of the Committee of Selection, must accompany each proof sent for exhibition.

III. It is necessary that the margins of all framed photographs should be kept in moderate space, viz. not exceeding 3 inches for the largest, and 2 inches for the smaller, exclusive of frames. Exhibitors, however, are recommended to place small photographs grouped together in one frame.

IV. Pictures which have already been publicly exhibited in London will not be received.

V. Nothing must be written on any photographic mount or frame, excepting the name of the photographer, which may be done in pencil.

VI. Prize Medals will be awarded for—

1. The best portrait or portraits.
2. The best landscape or landscapes.
3. The best group or groups, or composition or compositions, each from a single negative.
4. The best architectural subject or subjects.
5. The best printed impression from a photograph transferred to metal, stone, or other material, and absolutely untouched.

VII. Exhibitors desirous of selling their pictures will be permitted to make arrangements for that purpose with the attendant in charge of the Exhibition.

VIII. Members will have the privilege of free admission, and of the personal introduction of a friend; honorary members and foreign exhibitors, for themselves only.

IX. All works intended for exhibition must be delivered at the Gallery, free of all charge, on Tuesday and Wednesday, the 10th and 11th of May; each picture must be numbered, with name and address, together with price, if intended for sale.

X. The selection of pictures, hanging, award of Prize Medals, and all matters connected with the Exhibition will be conducted by the following Committee, who have been appointed to act for such purposes:—James Glaisher, Esq., V.P.; Lieut.-Col. Stuart Wortley, V.P.; Joseph Denham, F.S.A.; C. Thurston Thompson; and Dr. Diamond.

By order of the Council,
Hugh W. Diamond,
Secretary.

LONDON PHOTOGRAPHIC SOCIETY.

Ordinary General Meeting.
King's College, London.
Tuesday, April 5th, 1864.
Francis Bedford, Esq., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. **Shadbolt** called attention to the announcement in last month's Journal in reference to the forthcoming Exhibition, in which it was stated that persons who desired to exhibit, and were not Members of the Society, would be permitted to do so on payment of a guinea, the Council creating them Honorary Members for the occasion. Now he submitted that the Council could not create Honorary Members in this way; he was doubtful whether the Council could legally create Members at all; but in any case Honorary Members were non-paying Members, and the term was a misnomer. He had no doubt that the Council had the full confidence of the Society as regarded the management of the Exhibition; but an illegal act, however innocent in itself, might on some future occasion become a dangerous precedent.

The **Chairman** said the arrangement in question had been thought better than charging for wall-space, and as the most convenient as well as the most courteous, the payment of a guinea making the contributors Members for the time, without conferring other privileges.

Mr. **Shadbolt** did not question the policy of the arrangement, but the propriety of the term.

After examining the rule and some further discussion,

Mr. **Shadbolt** moved that the term "Members of the Exhibition" should be substituted for "Honorary Members."

Mr. **Wharton Simpson** seconded the motion, which was carried unanimously.

The **Secretary** exhibited some photographs taken by Mr. Brothers of Manchester, by the aid of the magnesium light, and read the following letter regarding them:—

"Photographic Rooms, 14 St. Ann's Square,
"Manchester, 4th April, 1864.

"I have the pleasure to enclose a few photographs which have been made by means of the magnesium light. Some of the details of their production have already been published in the Society's Journal, quotations from the 'Proceedings of the Manchester Literary and Philosophical Society' having been read by Sir David Brewster at the last Meeting of the Photographic Society of Scotland. I need not, therefore, repeat them here. Respecting the portrait marked No. 3, I wish to say that my remark as to its being equal to what could be done in ordinary daylight is not quite correctly reported. What I intended to say was, that in daylight, when an equal exposure in the camera would be necessary (about 2½ minutes), the result would be the same. This being the first attempt at taking a portrait by means of the magnesium light, it did not occur to me to burn more of the metal at the same time; but this was afterwards done with one of the copies, whereby the time of exposure was lessened two-thirds.

"The print marked No. 1 was taken by the magnesium light in 50 seconds. No. 2 is the copy made in the ordinary light of a winter's day, with slight fog in the atmosphere, the same exposure having been given. No. 4 is the copy of the marble bust of the late Dr. Henry. In taking this negative, it will be seen that the light was held steadily in one position. No. 5 is from a marble bust of the late Mr. Hodgskinson; and, in making the copy, the light was moved slightly, so as to soften the shadows, and a small piece of the metal was burnt on the *shade* side, so as to obtain more detail.

"The lens employed in all these experiments was a portrait-combination by Lerebour, the full aperture being used.

"I have tried the light for printing transparencies, and obtained a good print by burning *one-eighth of a grain* of the metal, the light lasting three seconds. Some experiments with the solar camera were tried, but could not be continued on account of my supply of wire being exhausted.

"The prints sent are not by any means the best that may be done by this artificial light. They are nearly all *first results*, the small quantity of the wire at my disposal preventing more than one negative of each subject being tried. There can, I think, be no doubt that in dull winter weather this new kind of light will be extremely useful to photographers; and for subjects in places where the light of day never penetrates sufficiently for photographic purposes, it will be extensively used. The two busts, of which prints are now sent, are so placed that it would be almost impossible to photograph them in daylight.

"You will perhaps oblige me by reading this at the next meeting. I had intended writing more in detail, but time has prevented my doing so."

The Secretary also announced that at the next Meeting Mr. Sydney Smith would take a solar-camera picture by the aid of the magnesium light.

A beautiful little Study of Flowers by Mr. Heisch was laid on the table, the picture being remarkable for the perfect gradation of tint. The Chairman asked Mr. Claudet to make some explanation.

Photosculpture.

Various specimens of this new application of photography to the production of busts and statuettes were exhibited by Mr. Claudet, and submitted to the inspection of the Photographic Society. These specimens have been sent by the Société Générale de Photosculpture de France, to show the degree of perfection which this new art has attained in Paris, with the view of introducing its practice in this country.

It appears that Mr. Claudet has made preparations, in concert with the inventor, or rather with the Society working out his process, to execute busts, medallions, and statuettes from photographs taken by him for that purpose.

The process of photosculpture has been invented by M. Willème, a sculptor of some eminence in Paris. The object of the invention is to save time to the artist, and to enable *him to* work with the greatest accuracy without having to trouble the person with long and numerous sittings.

The process may be briefly described in the following manner:—The sitter is placed in the centre of a large circular room covered with a cupola, all in glass. The wall supporting the cupola is pierced all round at equal intervals with 24 small holes, intended to allow 24 cameræ obscuræ, placed behind the wall in a dark corridor surrounding the building, to be directed on the sitter, and consequently arranged to receive at once his image in 24 different aspects, all round, from front to back on both sides.

A single sitting of a few seconds, not longer than for taking a carte de visite, is sufficient to produce at once 24 negatives, representing the person from 24 points of view. This is all that is strictly required from the sitter, and his bust or statuette is to be modeled in another part of the establishment, by means of the very ingenious apparatus which has to impart, all round, to a soft block of clay prepared for that purpose, the various contours of the separate negatives.

For this operation the 24 negatives are fixed in their order on the outer circle of a large vertical disc which can revolve on its axis by the mere impulse of the hand, so that each negative can be brought in its turn before the lens of an optical apparatus similar to a magic lantern, and left there as long as wanted. The image of the negative is projected on a screen of ground glass at a distance which will produce an image of the size wanted; on one side of the ground-glass there is a table or stand, capable of revolving horizontally upon its centre, upon which is placed a block of clay roughly shaped in the size and posture to be given to the model, and this block of clay, by the following operation, will soon be transformed into the bust or statuette required.

The artist holds in his hands a pantograph, with one end of which he can follow on the ground-glass the outline of the image, while the other end of the pantograph, supplied with a sharp tool, cuts the block of clay and imparts to it the outline of the first negative; when this is done, the artist brings the second negative before the magic lantern, turns the table holding the block of clay $\frac{1}{24}$th of its whole circumference, and following with the pantograph the outline of this second negative, cuts the block of clay on its new phase, and so on until every negative has been projected in its turn on the ground-glass screen and its image has guided the pantograph to cut the block on all its phases.

When the block of clay has been cut all round, the mechanical part of the process is performed, and then comes the artistical part, which has to give to the work its finish, and to impart a degree of refinement to the likeness; for it is easy to understand that the operation of cutting the various outlines must necessarily leave between them some small spaces in a certain state of roughness, and that the whole requires to be smoothed down and blended into an even and harmonious surface. Besides, many delicate details and complicated designs ornamenting the dress, which are shown on the photographs in all their perfection and minuteness, cannot well be transferred by the pantograph on the block of clay; they must be modeled in imitation of the photograph by a skilful hand, by means of the ordinary tools of the sculptor.

This is no reproach to the art of photosculpture, on the contrary, it is one of its advantages; for without the refinement and finish which an artist of taste and judgment can communicate to the work, availing himself of a short sitting from the persons to be represented, the result of the mere mechanical process might be too often a vulgar representation.

The success of photosculpture must therefore necessarily depend upon the artistic treatment, which can only be imparted by a skilful sculptor, and which can give to the work the stamp of a fine-art production.

From the execution of the specimens sent by the Société française de Photosculpture, there is no doubt that these new productions, uniting the truthful character of photography to the high refinement of the art of sculpture, will meet with general approbation; and it is certain that the moderate price at which photosculpture can be executed will ensure a large demand, and spread in all classes the taste for the works of sculpture.

The Chairman said he presumed that each figure had to pass through the hands of the sculptor to finish. It would have been interesting to have one in the rough unfinished state, to show how much was effected by the apparatus.

Mr. Claudet said that, of course, the skilled sculptor's aid was necessary in finishing. He would bring a rough specimen to the next Meeting.

The following gentlemen were duly elected Members of the Society:—

T. M. Brownrigg, Esq., Resident Magistrate, Maryborough.
Silas Eastham, Esq., Manchester.
T. Skaife, Esq., Sussex-place, Regent's Park.
Frank Good, Esq., Minories.

The Secretary exhibited two portraits, in enamel, of the President, which had been presented him by M. Marion, of Paris. They were executed by the process of M. Lafon Camarsac, for whom Messrs. Marion are the patentees in this country as well as in France.

The Secretary read the following letter from Mr. Ross, calling attention to some fine specimens of Messrs. Helsby's process on opal glass:—

"April 5th, 1864.

"Sir,—Will you be so kind as to place the accompanying pictures before the Meeting of the Society? They are the production of Mr. Helsby, of Liverpool, for which he has taken out a patent.

"I remain, Sir, yours truly,
"Thomas Ross.

"P.S. They are to be viewed as transparencies."

To Dr. Diamond, Secretary.

The Secretary called attention to some of Mr. Cooper's charming specimens of double printing.

The Secretary also called attention to a carbon print by Mr. Firling, of Dorchester, which was stated to have been produced by three minutes' exposure.

The Chairman called attention to two pictures sent by Dr. Watson, to ask the opinion of members as to what process the duplicate of the photograph had been produced by—whether photographic or photolithographic.

The Chairman announced that M. Laulerie, of the French Photographic Society, would be happy to receive pictures for the Exhibition from English photographers.

The Secretary called attention to some specimens of solar-camera enlargement by Mr. Aldis.

Mr. Swan then read the following paper on

A New Method of Carbon Printing.

Beautiful as the ordinary silver-printed photograph unquestionably is, as it comes fresh from the hand of the skilful printer, yet a troublesome doubt as to the duration of its beauty always more or less mingles with and mars one's admiration. There is, unfortunately, no denying the fact that ordinary silver prints are *very liable to fade*, and that immense numbers of them *do fade*. This constitutes the one great blot on the fair fame of our beautiful art, and has stimulated with the urgency of a necessity the search for *some process that would give photographic prints of reliable durability*.

In quest of such a process experimentalists have naturally thought of carbon as *the* substance, of all others, which (if photographic pictures could be produced with it as the colouring matter) would afford the strongest guarantee of permanence. Many attempts, attended with more or less success, have from time to time been made to attain this desirable object, but hitherto, I believe, none of the processes proposed have been so far practicable as to come into general use. Either the results have not been considered sufficiently perfect, or the means of obtaining those results have been too difficult or troublesome for commercial purposes.

I think I have succeeded both in obtaining good results and in obtaining them by means which are simple and adapted to operations on an extensive scale. The principal means by which I have arrived at this result is by the employment of a tissue pliant and manageable as paper, and transparent and smooth as glass. This tissue, in fact, takes the place of the paper or glass, one or other of which has hitherto been made use of as a means of supporting the photographic materials employed in carbon-printing. The tissue is formed of collodion on one side, and a gelatinous compound on the other. The gelatinous part of the tissue consists chiefly of gelatine, and contains a salt of chromium, carbon, and saccharine matter. The chemical principle that I have availed myself of in the carrying out of my idea was discovered twenty-five years ago by Ponton, and it is this—that gelatine, in combination with a salt of chromium, becomes insoluble in water after a short exposure to sun-light.

This principle is capable of application to photography in many ways, one of the most obvious of which is to mix a pigment with the bichromated gelatine, and coat paper with it: expose this paper to light, under a negative, and then wash away those portions of the coating not affected by the light. The exposed parts, having become insoluble, remain attached to the paper, and so produce a picture. But this mode of operation is inapplicable to the case of negatives containing half-tone, and for this reason:—The action of the light is to render the gelatinous coating insoluble, and, consequently, to fix the colour that may have been mixed with it. This action commences at the exposed surface, and extends through more or less of the thickness of the coating. Where the light has acted most strongly, perhaps the *entire thickness* of the coating is converted to the insoluble condition; but where the light has been obstructed by the half-tone of the negative, the converting action has perhaps only reached through *half* the thickness of the coloured coating: and observe, the converted half is the *upper* half, and half-tone would have to be got by the removal of the unconverted under half; but the insolubility of the upper stratum renders this impossible, the soluble under stratum being shut in and sealed by the insoluble upper stratum. So either the upper stratum must be *broken through* to let out the still-soluble under stratum, or the under stratum must remain where it is.

In one case there is the deep shade of the entire coating, and in the other the bare paper; either way there is no half-tone. To overcome this difficulty it was proposed by Mr. Blair to print from the *back* of the prepared paper, so that the light would pass through the paper, and strike *first* upon the *under stratum* of the coloured coating. The converting action of the light would then graduate from the *under* to the *upper*, instead of from the *upper* to the *under* stratum.

In this case, where only half the thickness of the coating was converted, the unconverted half would be *uppermost*, and there would therefore be nothing to prevent its removal. Improved half-tone was obtained in this way; but the light having to pass through the substance of the paper before reaching the sensitive coating, there was a serious loss of definition in the picture, and of time also in the printing.

Previous to the publication of Mr. Blair's proposal, I had recognized the principle of it, and had made some unsuccessful experiments with plates of glass coated with Mr. Pouncy's carbon mixture, exposing them in the camera with the uncoated surface of the glass toward the light, the light, therefore, acting from the under to the upper stratum of the carbon coating, as in Mr. Blair's plan.

But, as I have said, those old experiments were unsuccessful.

The way in which I *have* succeeded is by means of the tissue already referred to, both glass and paper being discarded altogether until after the printing.

I have already stated that the tissue is composed of collodion on one side and bichromated gelatine, mixed with sugar and carbon, on the other.

The mixture of gelatine that I used in making the specimens I have here consisted of 1 part of a solution of bichromate of ammonia (containing 1 part of the salt in 3 parts of water), 2 parts gelatine, 1 part sugar, and 8 parts of water, with colouring-matter added to produce the depth of tint required. The pigment used in most of those specimens is indian ink, either alone or mixed with indigo and carmine.

The tissue is *formed* by coating a plate of glass or other smooth surface, first with collodion, and then with the coloured gelatine mixture above described; the two films unite, and, when dry, may be separated in a sheet from the surface they were formed on.

By this means a pliant tissue is obtained.

(Here is a specimen.) It may be handled like paper, and may either be used in large sheets or cut up into pieces of any convenient size.

We have now advanced as far as the printing stage. The tissue, prepared in the manner described, corresponds with sensitive paper; and I think, with proper appliances, the preparation of it need not be more troublesome than the double operation of albuminizing and exciting paper in the usual way.

The tissue is much more sensitive to light than ordinary sensitive paper, and proportionately more care must be exercised to guard it from the action of light, other than that which acts upon it while in the printing-frame. Like sensitive paper, too, it is better used soon after its preparation.

The printing is done in the usual way, the tissue taking the place of sensitive paper, the collodionized surface being placed next the negative. The sensitiveness of the tissue may, of course, be varied by varying the proportion of the components of the gelatinous part of the tissue; but with the mixture I have given, which was used in making the specimens I have here, the time of exposure required is only one-third or one-fourth of that which would be usually given with highly sensitive albuminized paper.

The proper time of exposure can be determined pretty accurately after a few trials; for although there is not the same means of judging of the progress of the printing as in the ordinary process, yet there is a far *wider range* between *under* and *over exposure* than in silver printing. It is no exaggeration to say that you may expose one piece of tissue twice as much as another, and yet obtain a good print from both; not perhaps *quite* so good as between the two extremes, but yet much more passable than would be the case with silver prints under- and over-exposed to the same extent.

There is one means, however, by which *any mistake* in *timing the exposure may be altogether avoided*, and this is by the use of a PHOTOMETER. I am busy with experiments, with a view to the construction of a practically useful form of this much-needed instrument, and I hope soon to be able to place the result of those experiments before you. I cannot help remarking that it appears to me a kind of *disgrace* to us that we have so long stumbled on in the haphazard clumsy way we have done in the matter of exposure, sometimes under-exposing and sometimes over-exposing, and only now and then hitting the right degree exactly.

The use of a photometer, even in ordinary silver printing, would, I feel sure, avoid much waste of material, save time also, and lead to more uniformly good results. Instead of turning back the print from time to time to see how the printing goes on, at the risk of shifting the paper, letting in dust, and hurting the negative, we should only have to glance at one photographic clock, and that glance would inform us much better how the printing progressed than the more tedious mode of examination now commonly practised. With a proper classification of negatives, say into three classes, the weak negatives forming one class, the dense another, and the medium another, all of one class being exposed simultaneously, and with a photometer to determine exactly the amount of exposure which produces the best result, the operation of photographic printing on an extensive scale might be made as certain and uniform as common printing is.

I repeat, a systematic arrangement of this sort, combined with the use of a photometer, would prove very advantageous even in silver printing; and if carried out in carbon printing, it would completely meet the difficulty which may be supposed to attach more particularly to it, but which, practically, is not greater than in the process now commonly practised, because, as I have already said, a mistake in the exposure does not produce the same extent of failure in the carbon process as in the ordinary one.

On taking the tissue from the printing-frame, the image is faintly visible, and the next step in the process is to mount the tissue, with the collodionized face down, upon a piece of paper, or any other suitable material, to act as a support during development, and sometimes to form the basis of the picture, which may, if we please, remain permanently attached to this support, or may, if thought better, be afterwards transferred in a manner which I will presently explain.

There are several ways of mounting the tissue, and several adhesive substances may be used for the purpose. I have used starch with success; but the specimens which I shall have the pleasure of exhibiting to you were mounted upon paper by means of a solution of indian rubber and dammar in benzole.

After mounting, the tissue, with paper attached, is placed in water of about 100° Fahr. The water presently begins to dissolve away the non-solarized portions of the gelatine, and in a few minutes the picture is fully disclosed.

It is, however, advisable not to hurry the operation, but to give the water ample time to dissolve out the bichromate. It is also advisable to change the water three or four times. I prefer to leave the prints about two hours in the water. Where the picture has been over-exposed, longer immersion and hotter water will, in a great degree, rectify the mistake. Before finally removing the prints from the water, I brush their surface lightly with a broad camel-hair brush; and after taking them out, I pour a stream of water over them, to remove any loosely adherent particles of foreign matter that may, by accident, have got attached to the surface.

The prints may then be hung up to dry, and are finished by being mounted on cardboard and rolled, in the usual manner.

Another way of proceeding is to *remount* the developed print, *face downward*, upon a second piece of paper or card, say with starch or gelatine, and, when this is dry, to remove the paper that was attached to the tissue previous to development: this can easily be done, if the surface of the paper is moistened with benzole.

In one way the image is *reversed*, and the collodion surface is *downward*; and in the other the image is *not reversed*, and the collodion-film is *uppermost*.

In practice, I think the transfer process will not be found difficult; yet, probably, the simpler mode will generally be preferred, and the objection of the reversal of the image be met, either by taking the negative *through the glass*, or by transferring the negative by means of gelatine. I greatly wonder that negatives are not more frequently transferred: there is really no great risk of a miscarriage, and when it is done, the negative is much safer than when on glass; there is not the liability to breakage, nor the same chance of injury to the surface by use.

With respect to the material introduced into the gelatine to give colour, this may, of course, be varied, according to taste and the character of the subject. In some of the first pictures that I sent to Mr. Simpson, one of the aniline dyes was introduced; possibly these and other dyes also may be found useful in the coloration of the tissue.

Carbon produced by the action of sulphuric acid upon sugar has been proposed as a likely form of carbon for photographic printing. I believe this form of carbon will not be found suitable; it is of a flocculent character, and the particles, however finely ground, tend to agglomerate. The same objection applies to lampblack, although I have obtained some degree of success with it.

Although my operations in carrying out the process I have described have hitherto been conducted on a small scale, yet I feel assured that it is capable of being carried out on a large scale, and not only carried out, but with much better results than I have obtained.

It now only remains for me to thank you for the attention with which you have listened to me, and express a hope that you may look as favourably upon my process as you have upon my pictures.

At the close of his paper, Mr. Swan exhibited a number of very fine specimens, from card-size to 10 by 8, including portraits, landscapes, and sea-views. He also exhibited some examples of the tissue employed, and also some transferred negatives referred to in his paper. Mr. Swan's communication was received with much applause, and the specimens excited much admiration,

The Chairman, in proposing a vote of thanks to Mr. Swan, remarked that there could be no question as to the beauty of the specimens exhibited. They were as perfect as photographs could be, and possessed every quality which could be required.

Mr. Swan: Perhaps, Mr. Chairman, it may be well, before any discussion on the scientific phases of my process commences, to anticipate a question which I have no doubt is in the minds of many of the members; and that is, relative to the patent which, probably, most of you are aware, I have obtained for the process.

My first feeling was to communicate the process to your Society, and allow it to be practised without any restriction; and I communicated this idea to Mr. Wharton Simpson, who, with the alacrity of friendship, quickly made an arrangement, and had it announced accordingly.

A further consideration of the subject, and a recollection of the fact that photography has its commercial as well as its scientific aspects, determined a different course, and I have protected the practice of the process by patent; and in reply to the question how this is to be dealt with, as a matter of business, allow me to say that as yet I have come to no positive decision on this point.

I was most anxious that the Society, and through it photographers generally, should, as early as possible, be informed of the details of a process possessing so much interest, and have, therefore, communicated my process before the commercial bearings of the subject have been duly considered.

I may, however, say this, that if the patent-right remains in my hands, I shall probably charge a small premium to professional photographers, and impose a small tax, perhaps of a farthing for each picture sold, as I wish to participate to a small extent in the profits that may arise from *extensive* application of the process, rather than by laying on it so heavy a tax as to limit its use; and it would be quite averse to my feelings to impose any unwonted restriction upon the experimental development of the photographic art. I shall probably not put any restraint whatever upon the operations of amateurs, but allow my process to be practised freely so long as it is not a matter of trade.

I do not make this statement as of a matter definitely settled; but beg you to accept it with the qualification that they are merely hastily formed ideas which mature deliberation may require me to modify.

Mr. Thomas wished to know what points Mr. Swan claimed as original in his process.

Mr. Swan thought that his process possessed several very novel points. To mention one specifically, however, he might point to the fact that he discarded both paper and glass as a support for the sensitive gelatine, and formed a new tissue on which to produce his picture. He did not pretend to know all that had been done, but, to the best of his knowledge, no such tissue had ever been used before. There were several other points which were, he believed, novel.

Mr. Thomas said that Mr. Burnett had alluded to the use of sheets of gelatine, some years ago, in the 5th volume of the 'Photographic Journal.' It was important to know definitely what were the points claimed in the patent as new, as patents generally were obstructive of progress.

Mr. **Griggs** asked if Mr. Swan had been able to transfer his prints to metal or stone.

Mr. **Swan** said he did not remember the article referred to; but if Mr. Burnett suggested the use of sheets of gelatine only, they would not answer the purpose, without something to support them. The support of the collodion was quite essential. A general suggestion, without particulars or practical instructions, would not be of much service, or in any way affect this question.

The **Chairman** said that there could not be any doubt that Mr. Swan had produced specimens such as had never been shown before, and which possessed as well the valuable property of absolute permanency. [Applause.] The only point of regret was, that he was obliged to withhold the working details.

Mr. **Simpson** said, he feared that the Chairman had misunderstood Mr. Swan, who had already, if he were not mistaken, fully explained all necessary details.

Mr. **Swan** said he had intended to do so. He had given full working instructions, withholding no detail, but describing every step in producing the specimens on the table. He had not entered into details of further experiments since made, and not affecting the principle; but he had exactly described every step in producing the specimens before them.

Mr. **Sebastian Davis** would be glad to know a few more particulars as to the method of producing the sheets of tissue, as to the character of the collodion, and the mode of combining the two.

Mr. **Swan** said, ordinary uniodized collodion was used, and he could best answer as to the method by reading again the paragraph in his paper describing his operations [reading the paragraph].

Col. **Stuart Wortley** asked if there were any peculiarity in the gelatine, and what was its price.

Mr. **Swan** said, it was ordinary gelatine; he had only used one sample, but could not state the price.

Mr. **Davis** remarked that the tissue consisted, he presumed, chiefly of gelatine, as it was much thicker than ideas of collodion suggested.

Mr. **Swan** said, Yes.

Mr. **Seeley** said, he presumed that the purpose of the collodion was to enable the gelatine to be stripped from the glass.

Mr. **Swan** said, that was not its only purpose, as he had explained.

Mr. **Shadbolt** said, if he had rightly apprehended Mr. Swan whilst reading his paper, collodion was the very basis of operations, and without it the gelatine would fall to pieces.

Mr. **Swan** said that this was the case.

The **Chairman** presumed that if there were no collodion, the lights of the finished picture would be a series of holes.

Mr. **Swan** said, Undoubtedly.

Col. **Stuart Wortley** asked what advantage collodion had over paper for the purpose.

Mr. **Swan**: Its superior transparency and thinness made all the difference between good and bad results.

Col. **Stuart Wortley** did not quite see how the water was to get at the gelatine under the collodion film.

Mr. **Swan** explained, that whilst the action of light took place through the collodion film so as to get at the under surface of the gelatine, the water acted on the upper surface, dissolving only the gelatine not acted upon by light.

Mr. **Hennah** said, it appeared that the pictures must be reversed.

Mr. **Swan** pointed out amongst his specimens some which were reversed, and some which were not so, to show that no such necessity existed. He referred to the method described for reversing them, and also to the methods he had described for reversing the negative. The method of transferring a negative to gelatine was very simple and convenient. He poured a coating of gelatine over the unvarnished negative; and when that was well set, he varnished it. The whole was then easily removed from the glass, and consisted of collodion on one side, which was waterproof, and of varnish on the other side, so that the gelatine was fully protected.

Dr. **Diamond** referred to Mr. Archer's patent for transferring the film with gutta percha, gelatine, &c.

Mr. **Swan** said that further experience had not confirmed the idea at one time entertained of the value of gutta percha, as it was apt to oxidize and become brittle. The best method was, he thought, with gelatine, as the negatives he now exhibited illustrated. Gelatine was poured over the collodion film, allowed to set, and then varnished with a good varnish. It was then easily removed from the glass, and answered every purpose better than on the glass.

Mr. **Hennah** said, still it appeared that the prints were ordinarily inverted.

Mr. **Swan** said, Not at all; it entirely depended upon the taste of the manipulator.

Mr. **Davis** said that the process requiring only one-third of the exposure of albuminized paper was equally important and singular. All such processes, hitherto, had required very long exposure. He wished to know whether the collodion film in any way affected the sensitiveness, or to what it was due.

Mr. **Swan** had not made experiments to ascertain certainly to what the especial sensitiveness was due; but he thought it most probably due to the use of a large proportion of sugar in the gelatine.

Mr. **Davis** asked if grape-sugar or ordinary sugar were used.

Mr. **Swan** said, ordinary white sugar.

A **Member** asked if Mr. Swan had ascertained whether the image could be transferred to stone or metal with a view to being printed at the printing-press.

Mr. **Swan** said, this process was not placed in competition with any of the printing-press processes, but rather as the analogue of the silver-printing process. He had made some experiments in its application to engraving, but was not prepared at present to enter into details. He had not tried it upon stone. He did not think it probable that upon stone, or upon blocks in relief, half-tone would ever be obtained. On engraved plates, for printing at the copper-plate press, he had considerable hope of securing a successful issue as regarded half-tone. It was possible that the method he had been describing might be used in Col. James's process, as a means of transfer.

Mr. Seeley asked if the gelatine should dry spontaneously or by heat.

Mr. Swan said, it was quite unimportant.

Mr. Seeley wished to know if ordinary negatives would still be useful, and how with various negatives the printing was to be timed.

Mr. Swan said that negatives might easily be classified, and different classes printed together as he had suggested, so that, by examining one, the progress of all might be determined.

Mr. Seeley said that he noticed one of the prints had a tendency to leave the mount; was this from defective mounting?

Mr. Swan said, very likely the mounting might be defective.

Mr. Tunny (of Edinburgh) said, he was not a member of the Society, but, as an old photographer, he might be permitted to say a few words. He was sure that every old photographer would hail this new process with great gratitude. For his own part, he was perfectly overjoyed to find a carbon process give results equal to silver prints, and he thought it quite out of place to cavil about the details of a process which already presented such beautiful results; and if metallic pigments could be introduced with the same facility as carbon, he saw at once the method by which enamels like the beautiful productions of Camarsac could be produced. He had been struck with the fact at once on hearing the details, and he had little doubt that Camarsac's pictures were really produced by a similar process. He hailed with delight the advent of the only process hitherto which seemed to meet every requirement.

Mr. Swan said that metallic pigments could be introduced, and, in fact, the whole of the pigments used by the painter, giving a range of tint hitherto quite out of the reach of the photographer. He had not overlooked the possibility of applying the process, suitably modified, to the decoration of glass and porcelain, and similar purposes, where a burnt-in or enamel process was necessary. He here would take occasion to mention and thank the gentlemen who had lent him negatives. The large pictures and the sea-views were from negatives by Mr. Wilson, some of the portraits from negatives by Mr. Piper, of Newcastle, some from Mr. Heaviside, of Durham, and the portrait of Mr. Hardwich, and that of Mr. Henneman, from a negative of Mr. St. George.

Mr. Shadbolt said, he thought it important to remark that he thought Mr. Tunny was in error in supposing this process the basis of Camarsac's, which had been published four or five years ago. If it were the same as Mr. Swan's, there would be an end of the patent; but it was clear that Mr. Tunny was in error, he thought.

Mr. Tunny said, he was in M. Camarsac's atelier three days ago, and that gentleman informed him that not a soul knew anything of this process but himself.

Mr. Wharton Simpson said that Mr. Shadbolt was perfectly correct in stating that some years ago a paper was published by M. Camarsac, purporting to explain his process; but, as it had the singular merit of not explaining a single fact or detail, the reader had learnt nothing when he had read it; and therefore Mr. Tunny was also right in saying that no one knew anything about it.

The Chairman asked if any of the Members had come to any conclusion as to the photographs upon which Dr. Watson had invited their opinions.

Mr. Shadbolt, in answer to the Secretary, expressed his opinion that the duplicate was too bad to be a photograph.

The Chairman said, he had been requested by Mr. Greenwood to call the attention of Members to the fact that a fair was about to be held in the United States, to obtain funds for relief of the wounded, and that contributions of photographs would be thankfully received. (See page 31.)

Mr. Hennah said, he thought they could not do less than give a vote of thanks to Mr. Swan for his interesting paper and excellent specimens.

The Chairman thought he had already moved that the thanks of the Meeting be given to Mr. Swan.

Mr. Swan said the error arose from his omission to acknowledge the thanks which had been voted.

Mr. How exhibited a very convenient dark tent for the field, which was light, portable, easily packed up, and easily erected; it was well ventilated, and very convenient to work in. Plates up to 10 × 8 or 12 × 10 could easily be worked in it. The weight was from 18 lbs. to 20 lbs.

Col. Stuart Wortley asked if it was not very similar to Edwards's Registered Model Tent.

Mr. Rouch thought it quite the same.

Mr. How believed not, but it was a point for the Members and the public to decide.

The Chairman announced that at the next meeting Mr. Skaife would explain some improvements in his pistolgraph, and Mr. Hennah would describe his process of printing and general mode of operating.

The Meeting was then adjourned until Tuesday, May 3rd.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

Ordinary Meeting.

April 12, 1864.

C. G. H. Kinnear, Esq., Vice-President, in the Chair.

The Minutes of the previous Meeting were read and approved of.

Mr. J. T. Taylor then read the following paper—

Popular Notes on Photographic Lenses.

Part II.—Landscape Lenses.

In the first part of this paper, which was read before this Society upwards of a year ago, when treating of portrait-lenses, the subjects of astigmation, over- and under-correction, &c. were also considered. Hints were also given how to ascertain if a lens had been properly achromatized for photographic purposes, and rules for finding the equivalent focus of a combination. Bearing these in mind, we now proceed to consider, in an equally discursive manner, the subject of LANDSCAPE LENSES—a subject which, it is reasonable to suppose, is possessed of more interest to amateurs than that of lenses solely intended for portraiture.

If a plano-convex achromatic lens be mounted—without any stop—in a camera, it will be found that when the convex side is turned outwards an image of a certain degree of sharpness will be obtained in the ground-glass, but that such sharpness will be confined to a very limited portion of the plate. A good telescopic object-glass reproduces objects in its axial line with great intensity, and for the purpose of taking a distant object with the greatest possible rapidity and sharpness a lens of that form might be employed; but it would have this disadvantage, that the angle of view reproduced with proper definition would be extremely limited—for instance, not over one degree, except for photographing such an object as the moon; and it would be consequently useless to the photographer who requires his lens to include from thirty to sixty degrees. If the plano-convex lens alluded to be so mounted as to present the flat surface to the view, there being still no diaphragm or stop in the tube, it will be seen that, although the field is much flatter, no one part is now sharp. This is caused by the property known as spherical aberration—that is, the tendency of the edge of a lens to bend or refract an incident ray to a greater extent when falling on the edge than on the centre of the lens. In a single achromatic landscape-lens spherical aberration is got rid of—at least to an extent great enough for practical purposes—by putting a diaphragm or stop at a certain distance in front of the lens. In tracing the course of oblique rays after passing through a lens, it is found that good definition, coupled with maximum flatness of field, can only be obtained when the edge of the lens is employed in forming the edge of the picture, and the centre of the lens similarly employed in the formation of the central portions of the picture. Without a stop, all is haze and confusion; but immediately the stop is inserted, sharpness and approximate flatness of field are the results.

I have often heard it said—"Seeing such a small aperture is employed in front of a landscape-lens, why not employ a very small lens without a stop before it?" If the foregoing be not considered a sufficient answer, I would further reply—"Just try the comparative merits of a picture taken with a stop at the proper place, with one taken when the stop has been pushed up in close contact with the lens so as to make it in effect a lens of the diameter of the aperture in the stop, and I warrant that the result of the comparison will be such as to satisfy any one that there is indeed a vast difference." Whatever the diameter of the lens employed—though it be no larger than a pea—there must be a diaphgram in front of it, if the best-defined and flattest picture possible to be obtained from such a lens be desired. You will observe that the question of large *versus* small lenses, raised some time since by Sir David Brewster, does not apply in the case of the diameter of view-lenses, which are all supposed to have a small stop in front where the rays cross, but is rather applicable to lenses so constructed as to work with full aperture, such as portrait-lenses. The peculiar doctrine of Sir David Brewster alluded to, although a good deal misunderstood at the time, and even so now, is held by many acquainted with the higher branches of optics as incontrovertible. Among those whom I have heard speak in somewhat decided terms of the correctness of Sir David Brewster's doctrine is Mr. Shadbolt, the chief editor of 'The British Journal of Photography.'

I should have remarked that the best general form of a view-lens is the periscopic or meniscus form. A view-lens of the kind now described will give excellent definition, embrace an angle of tolerable width, and be altogether unobjectionable as a landscape-lens; but when employed for architectural or other similar subjects, it will be found that straight lines in the original are represented by slightly curved ones in the photograph, this curvature becoming more apparent according to their distance from the centre of the picture. When only a limited angle of view is embraced, this kind of distortion, although existing, may not be appreciable to the eye; but when a larger angle of view is embraced, or the lens comes to be overtasked, then the curvature of the pseudo-straight lines becomes more and more apparent.

It would encroach too much upon time at present to enter into the cause of this distortion. Let it suffice to say that this kind of distortion is inherent in all single lenses with a stop in front, and has its foundation in the fact that the edge of the lens refracts more than the centre. Generally, the smaller the diameter of the lens the less of this peculiar kind of distortion will there be; and if a view of a building be taken with the stop in its ordinary place, and compared with another having the stop placed very much closer to the lens—the stop at the same time having a sufficiently small aperture to render the view equally sharp with the other—it will be found that the curvature of the lines of the building is diminished in proportion as the effective diameter of the lens has been diminished.

The practical lesson to be derived from this appears to be—when taking a general landscape, use the stop in its normal position; but when taking a building or any other subject in which the curvature on the ground-glass is apparent, use a smaller stop at a smaller distance from the lens.

All that has been said about the ordinary view-lens applies to that peculiar form known in commerce as the aplanatic lens, the difference between them consisting in the method by which they are corrected. For these peculiar differences, I refer you to the black board on which I have drawn both. I have on the table several aplanatic and other view-lenses, but with the experience I at present have of their working, I am unable to institute a comparison between them; in the mean time I am unable to discover any points of superiority possessed by the one over the other.

To obviate the curvature produced by the meniscus lens, Professor Petzval devised a compound lens which was intended to reproduce objects with accuracy. This is known severally by the names of "orthoscopic," "orthographic," "caloscopic," &c., lens, the principle of construction being alike in all.

This lens includes a large achromatic towards the front of the tube, and a smaller one behind it. The front lens is a cemented achromatic; the back one is not cemented, and is concave in its character. It lengthens the focus of the front one, flattens the field, and is intended to cure the distortion alluded to. As the lens is usually constructed, however, it overdoes this, producing a kind of distortion of the sand-glass kind—indeed of an exactly opposite nature to that produced by the old-fashioned lens. There is perhaps no lens extant that is of such an accommodating nature as this one. Just let me describe the properties of the individual lens now submitted for inspection. It occupies, as you see, a quarter-plate mount, with Waterhouse diaphragms. The focus measured from the back lens is about fifteen inches, and the size of plate covered, when the smallest stop is used, is twelve by fourteen inches. When used without any stop whatever, with an aperture (that of the smaller or back lens) of one and a half inch, it gives beautiful, crisp definition, flat of course only on a limited size of plate, but with such freedom from astigmation as to allow of a group to be taken on a twelve-by-ten plate with full aperture. Theory, they say, has decided that it is impossible to take a picture with this class of lens having the marginal lines free from curvature. I have only to say, "so much the worse for theory," for this lens gives pictures in which it is impossible to detect any curvature.

When the glasses are arranged as I now show you, the lens suddenly becomes possessed of a new property, which is the much-disputed one of depth of focus, or, more strictly, depth of definition, covering a large field flat without any stop whatever. The fine, crisp definition which in its original position it had is gone: it now gives a picture *generally sharp* all over the plate, but particularly sharp nowhere. In short, it has no real focus at all. For many subjects, however, this is rather advantageous than otherwise, as one may not care at all times to take a picture microscopically sharp; and when for pictorial effect this peculiar kind of definition is desired, it is better to obtain it by giving the lens a little aberration in this way than by the more common manner of putting the subject a little out of focus; for by this latter method, if the middle distance be out of focus, there is a chance of the foreground or background being still in sharp focus, and *vice versâ.*

Mr. Fox Talbot at the time of his great discovery seemed to be aware of the importance of occasionally securing a certain degree of degradation of the sharpness in certain subjects, portraiture among others. The plan long ago recommended by him for this purpose, but now apparently forgotten by many, was to insert between the negative and the sensitive paper one or more sheets of uniformly dense paper. This method is still worthy the consideration of photographers. When the lens before us is so adjusted as to give perfect freedom from distortion, the picture produced by it is generally otherwise inferior to what it produces when so arranged as to give slight distortion of the sand-glass character. I should state that this distortion—when the lens is adjusted to its best condition for landscape purposes—although it does exist, is of such a slight nature as to prevent its being detected on a moderately sized plate unless by strict measurement.

Were a comparison to be instituted between the orthoscopic and ordinary view-lenses as to their respective merits for field-work, I would say without hesitation that the old form of lens is the better.

In the 'Mechanics' Magazine' for, I think, 1847 or 1848, there was an account of a lens which gave perfect freedom from distortion, besides possessing other advantages. It consisted of two meniscus lenses, one at each end of a tube, the convex sides out, with a stop between. This, as you are aware, answers in a general way the description of the Harrison globe lens. The globe lens seems to have found more favour across the Atlantic than in our country. Having only examined one of these lenses, I am not in a position to say much about it. It seems to include an angle of considerable width, and reproduces subjects free from distortion. A very small stop is required. The lenses are placed at such a distance as to make the two convex surfaces portions of a sphere or globe, from which the name is derived. You will see that the axial pencil is not only wider than the oblique pencil, but it has also a shorter distance to travel to the ground-glass; the consequence of which is that the centre of the picture is much more illuminated than the extreme edges. This, I am aware, is the case with all lenses having circular apertures in the diaphragms; but the defect is more noticeable in this lens than in any other, from the great obliquity at which the ray passes through a circular hole in a flat plate. With such a lens equality of illumination can only be secured in one or other of these two ways—either by means of Sutton's "butterfly" or equalizing stop, in which the oblique pencil is as large as the axial one, or by still retaining the ordinary diaphragm, and constructing the crown-glass lenses of such a green colour as to cause, by its greater resistance to the light when passing through the thick crown glass in the centre, a retardation sufficient to compensate for the more feeble action of the attenuated oblique pencils. Mr. Bow, civil engineer, was the first to point out this useful property in coloured crown glass, and he has followed it up by a mathematical investigation of this subject, the results of which he has published.

To present the present paper being of an undue length, I fear I shall have to inflict on the Society at some future time a third chapter, of which Triplet and Panoramic Lenses will form the subject.

[The Printer not having received the diagrams in sufficient time, they are unavoidably omitted.—Ed.]

At the conclusion of the paper the Chairman proposed a vote of thanks to Mr. Taylor, and trusted that he would be induced to continue the subject on a future occasion.

Mr. Moffat exhibited to the Meeting portraits of Sir David Brewster, taken by him by the light of magnesium wire in combustion; the exposure being 60 seconds. Mr. A. Brothers, of Manchester, also exhibited portraits and busts taken by this light, including the one referred to at last Meeting, copied from an engraving—the first ever taken by the magnesium light.

The Secretary read a letter from Mr. Brothers to Sir David Brewster, in which he says, "At the conclusion of a lecture I delivered last week on the microscope, I showed the difference between the light from ordinary gas, the lime-light, and magnesium, burning the three at the same time: the difference in favour of the magnesium was very marked."

Mr. Pringle, of Messrs. Ross and Thomson's, photographers to the Queen, exhibited and explained the apparatus invented and constructed by M. Dagron, of Paris, for taking Photomicrograms.

Mr. Walker exhibited to the Meeting some negatives he had exposed and developed that day, the plates having been prepared by the tannin process, six months previously. He stated that the plates were quite as sensitive, after that lapse of time, as if they had been freshly prepared.

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The same proviso extends to communications to the Editor.

Notes on the Oblique Pencils.

To the Editor of the Photographic Journal.

Sir,—The method I gave for the computation of the focus of an excentrical pencil in vol. viii. p. 422, by the artifice of its being supposed to be built up out of three distinct lenses, is only correct to a certain degree. It will be seen in that paper we were discussing the focus of an oblique pencil falling on an equally double crown of 10 radius, whose principal focus for the lens, accounted quite thin, would be half of 19·23, the top number in Table, p. 302, vol. viii. or 9·61, and the inquiry was for the focus of an oblique pencil having 24° inc. on the first surface, and 12° interior inc. on the emerging surface, the thickness at the passage of the ray being taken at $\frac{2}{10}$ths of an inch. The rule there given will, I suppose, appear exceedingly plausible to most persons, as it did to me, but not to the extent of an actual demonstration of its holding good generally, or of its being perfectly accurate even in that case: *that* I could not give, and shall not be able to give, as the rule appears essentially only *approximate*. As I had allowed the rule to be printed without the understanding that it was only *approximate*, I have interested myself particularly to ascertain about its accuracy, and how far it required correction: the result of these inquiries it will now be proper to state.

Through the very great kindness of Prof. Potter of the University College, I have been put in correspondence with a gentleman there who has actually performed the calculation three times, in two different ways. At the first onset some trifling error had crept in, both in my own trigonometrical calculations and that of my assistant; and in the interval, demurring what I had better do, I wrote to Prof. Challis of the Cambridge University, who has most handsomely supplied me with a calculation at full length, using the differential calculus. The results obtained by the several methods are as follows:—

Mr. —— of the University College, London	8·106
Ditto by a new method	8·107
Professor Challis, as interpreted by Mr. ——	8·112
My own trigonometrical determination	8·103

These results are essentially the same, the extreme difference being less than $\frac{1}{100}$th of an inch; and even the fact of my own result being the smallest by a few thousandths of an inch is accounted for by the fact of my considering the pencil as 1° broad, for the sake of getting a base, while the equational mode makes it indefinitely small.

The primary focus by correct analysis is thus 8·11, while the same worked out by the rule given at page 422 is 8·38, making a difference of ·27. That rule is therefore approximate only, and gives a result not short enough by about one-fifth of the whole shortening due to obliquity; but, considering the facility of that method, I do not regret having published it, although I shall presently supersede it by a more accurate method, depending on the new Tables that I here present. It is computed for two kinds of glass—crown, μ 1·52, and light flint, μ 1·58; and the differences between column 1 and 2 are sufficiently regular to render it easy to interpolate for crown of μ 1·53.

Table of the Primary Focus of a converging pencil incident on a plane emerging surface. The focus of incident rays within the medium being 10, the emergent foci for different obliquities will be as follows, shortened to—

Inc.	μ 1·520.	μ 1·580.	
°	in.	in.	
0	6·579	6·329	The focus of the rays in the secondary plane is the same for every obliquity, and equal to the Primary Focus for Inc.=0°.
1	6·576	6·326	
2	6·568	6·318	
3	6·555	6·303	
4	6·537	6·283	
5	6·513	6·257	
6	6·484	6·225	
7	6·449	6·186	
8	6·408	6·142	
9	6·363	6·091	
10	6·311	6·035	
11	6·253	5·971	
12	6·189	5·901	
13	6·120	5·824	
14	6·043	5·740	
15	5·960	5·649	
16	5·870	5·551	
17	5·773	5·444	
18	5·669	5·329	
19	5·557	5·206	
20	5·437	5·074	
21	5·308	4·933	
22	5·172	4·783	
23	5·025	4·623	
24	4·870	4·453	

The secondary focus is independent of obliquity, and equals the primary or normal value for the vertical inc., or 0° for every obliquity. The numbers in this Table were computed by the following rule:—

Take the primary focus of a pencil emerging from the crown plane surface for inc.=0° for illustration—

1·000000 log 10 foc. incident pencil
+ ·181844 log μ glass to air +
·818156

This is log of 6·579 focus for inc. 0°, and is used in the remaining numbers of column 1 in the following manner:—

Take that for inc. 1°—

cos² refracting angle ...... —9·999694
cos² inc. .... 9·999868
— ‾·000174
constant log foc for 0° inc. ·818156
‾·818982
log of primary focus .... 6·576

One of the uses of this Table, and a very important one, is this, that it enables us to compute the focus of an excentrical pencil in an accurate manner, as we are now able to show.

For this purpose take the same case as formed the subject of the last illustration, where the pencil being incident at 24° obliquity on the first surface and 12° on the emerging surface, with a thickness of ·2, has its focus at 8·11, according to the University calculations. Now it is evident in this case we have a pencil converging within the medium from the first surface to 25·61, and on its arrival at the emerging surface deducting the thickness makes it 25·41.

In the Table, column 1 for crown glass at 12° inc. for emergence is 6·189; then say

10 : 6·189 :: 25·41 : 15·73.

10 is the convergence of the pencil in the Table, and 25·41 the real convergence in the case before us, and hence 15·73 is the focus of a pencil having passed through a convexo-plane lens, and emerging consequently at a plane surface. The emerging surface of the lens is not plane, however, but 10 convex, whose focus for an obliquity of 12° is (see Table at page 302) 16·73; hence we have now to combine two foci together only, and not three; wherefore, multiplying 16·73 by 15·73, and dividing by the sum, we get 8·106.

It would appear, then, that this method is perfectly trustworthy, as it gives the primary focus exactly the same as the rigorous calculations already alluded to; this is indeed to be expected, as the Tables are very carefully computed from sound formulæ, as has been already shown.

It will now be proper to allude to the calculations of Professor Challis and Mr. ——. The former calculation involving the differential calculus, I should fail in doing justice to it without a great deal of space; so that I shall defer it, along with my own, at least for the present, and present only the ingenious solution supplied me by Mr. ——; this will be intelligible without a diagram.

Let P be the point of incidence on the first surface, and R the point of emergence;

i=incidence, first surface;
e'=incidence, second surface;
i'= ∠ of refraction, first surface;
e= ∠ of refraction, second surface;
q_1=primary focus after emergence;
q_1'=focus from first surface;
δ_1=deviation at first surface;
δ_2=deviation at second surface;
r=radius lens;

$$Pq_1' = r\,\frac{\sin i\,.\cos^2 i'}{\sin\delta_1}; \quad \ldots\ldots\ldots\ldots \quad (1.)$$

and if

$$\frac{\sin e\,.\cos^2 e'\,r}{\sin\delta_2\,.\,Rq_1'} = \tan^2\phi, \quad \ldots\ldots\ldots\ldots \quad (2.)$$

$$Rq_1 = r\cos^2\phi\,.\,\frac{\sin e'\,.\cos^2 e}{\sin\delta_2}, \ldots\ldots\ldots \quad (3.)$$

Rq_1 is the primary focus required.

Rq_1' is the focus of first surface beyond emerging surface.

$i=24°$, $e'=12°$, $r=10$, $\mu=1·52$, thickness $=·2$.

$\sin i$	$\bar{1}·60931$	$\sin e'$	$\bar{1}·31788$
$\log\mu$	$·18184$	$\log\mu$	$·18184$
$\sin i'$	$\bar{1}·42747$	$\log\sin e$	$\bar{1}·49972$
i'	15° 31′·3	e	18° 25′·4
$\log\cos i'$	$\bar{1}·98387$	$\log\cos e'$	$\bar{1}·99040$
$\log\cos i$	$\bar{1}·96073$	$\log\cos e$	$\bar{1}·97715$
	24° 0′·0	$\log\cos^2 i'$	$\bar{1}·96774$
	15° 31′·3	$\log\sin i$	$\bar{1}·60931$
	8° 28′·7 $=\delta_1$		$\bar{1}·57705$
		$\log\sin\delta_1$	$\bar{1}·16861$
	18° 25′·4		$·40844$
	12° 0′·0	$\log r$	$1·00000$
	6° 25′·4 $=\delta_2$	$\log Pq_1'$	$1·40844$

Pq_1' $=25·612$
thickness $·200$
Rq_1' $25·412$ log of $1·40504$.

The result, Pq_1', corresponds with mine in Table in vol. viii. p. 212 for 24°, where it is found to be 25·610; this is focus of the first surface measured from the point of incidence, whereas Rq_1' 25·412 is the same measured from point of emergence; the formula (1.) is the same as I have given at page 212, in words instead o symbols.

$\log\sin e$	$\bar{1}·49972$	$\log\sin\delta_2$	$\bar{1}·04873$
$\log\cos^2 e'$	$\bar{1}·98080$	$\log Rq_1'$	$1·40504$
	$\bar{1}·48052$		$·45377$
	$·45377$		

$\bar{1}·02675 = \log\tan^2\phi = ·02675$
$\log\tan\phi = ·01337$
$\phi = 45°\ 52'·9$ log cos $\bar{1}·84270$

$\log\cos^2\phi =$	$\bar{1}·68540$
$\log\sin e' =$	$\bar{1}·31788$
$\log\cos^2 e =$	$\bar{1}·95430$
	$\bar{2}·95758$
$\log\sin\delta_2$	$\bar{1}·04873$
	$\bar{1}·90885$
$\log r$	$1·00000$
$\log Rq_1 =$	$·90885$
$Rq' =$	$8·1068$

This solution appears to me very neat, an does Mr. —— great credit. By means of th Tables, however, we can derive a solution o the important problem of the excentrical penci without even the use of logarithms, if we desir to do so.

J. T. Goddard

◆

"*Photographs for the Relief of Distress.*"

Philadelphia, March 7th, 1864.

During the first week of June next will be held in Philadelphia one of the great fairs in aid of the Sanitary Commission. It will be styled the "Great Central Fair of the Sanitary Commission."

The Commission has appointed committees in every department of art and trade, and to these committees the collection of the articles for sale has been entrusted. The department of photography has been given to Mr. Frederick Graff, 1337 Arch-street, chairman, assisted by Messrs. Guillou, Fassit, Sergeant, Davids, Sellers, Borda, Cresson, and Sturgis, of Philadelphia, and Captain Brereton, of Pittsburg, Pa. Mr. J. C. Browne, 907 Clinton-street, Philadelphia, is secretary, and Mr. S. F. Corlies, 1717 Arch-street, is treasurer to the committee. It was at first proposed that an exhibition of fine photographs should be opened, and donations of pictures, apparatus, &c. solicited for sale; but it has been decided by the executive committee that no objects be received for exhibition except paintings, statuary, and articles of great curiosity, such as relics. The attention of the photographic committee will therefore be directed to collecting the largest amount of pictures for sale. These pictures will be arranged in the form of an exhibition, and the donations solicited are of everything connected with the art, such as mounted prints of every kind, portraits of distinguished persons, copies of original drawings, paintings, and engravings, local and other views, microscopic objects, stereographs, magic-lantern slides, or, in fact, any objects of interest connected with photography and likely to prove saleable.

We have seen with feelings of gratitude how liberally THE BRITISH JOURNAL OF PHOTOGRAPHY and all the other English photographic journals have noticed the appeal made by Messrs. E. and H. T. Anthony, of New York, for donations to the New York Fair for the same purpose; and already we hear of liberal gifts from our friends in the old country. May not we also, coming to you as a committee having especially in charge all that pertains to the art of photography, receive a share of your beneficence? No more worthy object has ever been presented to the public for encouragement. Every dollar devoted to this noble Commission carries with it an incalculable amount of good to suffering humanity.

My pen is unable to convey to you the slightest idea of the value of the organization as it now exists and as it has been perfected during the past three years. Could you, as I have done, talk to the poor wounded soldiers who throng our hospitals, and hear what they say about the Commission—how they thank it for their very lives—you would feel, as we do, that no better work can be done than aiding this preeminently Christian enterprise. It is no enviable task the noble members of the Commission have undertaken. In war they see all that is revolting—all that makes the heart bleed with anguish—and yet they have none of the excitement of the soldier's life to sustain them. A veteran once said to me, "The place I like in battle is the front, no matter how hard the fight may be; but to be placed in reserve, to see the poor wounded fellows carried to the rear, and to hear their cries and see their suffering, this is unbearable." And yet this is the place accepted by choice by the Sanitary Commission. The soldiers rush on or retreat from the field of strife, and soon the scene is forgotten in the excitement of fresh adventure; but when the air is reeking with the horrid effluvia of a stale battle-field, the Sanitary Commission have their work to do. It is to aid them in this task of charity—this attention to BOTH FRIEND AND FOE—that we beg for substantial aid.

Donations will be thankfully received and acknowledged if sent addressed to Frederick Graff, Chairman of the Committee of Photography for the Central Fair, Sanitary Commission Warehouse, Philadelphia, Pa., sending at the same time an invoice, giving the number and description of the articles, also addressed as above. Articles may be sent by express, free of charge, by the donors, the freight-charges, if any, being arranged by the Sanitary Commission here. Every package should be marked *for the purpose of the fair only*, and then they will pass our custom-house free of all examination or charges.

As a hint for what would prove the most saleable, I would say that views of English scenery and of ruins and places of historical interest are very desirable; for England's history is our own history, as its language is our language. Pictures of distinguished men are sought after with avidity; and if we could only have the cards of those men who have done so much to advance our noble art—pictures of photographers, professional and amateur—I know of one who would purchase freely, and would keep them too, with care; and he is not alone in his desire to see the faces of those whose work with the camera or with the pen has so much interested us. I could tell you of a little album, not far off now, in which can be found friend Rejlander "looking up for better days;" H. P. Robinson, with his thoughtful brow, the joint representative with Rejlander of art-photography; Mr. Shadbolt, Mr. Dawson, Mr. Hardwich, and many more, not forgetting my kind friend the publisher of the 'British Journal of Photography;' and at the end is one half of a stereograph of a photo-picnic, one Good Friday, some years ago, in which, with the aid of a microscope, Mr Simpson, of the 'News,' and many more can be made out. The pleasure with which this album has been examined at the Society's rooms and at home shows the interest felt in the people whose facces are there represented. Microscopic subjects would be as good as gold, for there are a great many in our little city who are interested in this instrument.

We hope that liberal contributions will enable the Committee to make the photographic department an attractive feature of the fair. In future letters I hope to describe all the interesting objects received for this worthy purpose. Inasmuch as the fair is the object of all-absorbing interest for the time with us here, it shall be the one subject of this letter; and although I had other things to write about, I will defer them until another letter.—I am, with due regard, Coleman Sellers.

'British Journal of Photography,' of April 1, 1864.

GODDARD TESTIMONIAL FUND.

	£	s.	d.
Subscriptions already acknowledged	338	0	10
G. & J. H. Hall, Wakefield	0	10	0
M. Stodart, Esq.	0	10	0
Mr. John Simpson	0	2	6
Jas. Rae, Esq., Dumfries	0	5	0
John Macnair, Esq., Edinburgh	2	2	0
F. H.	0	2	6
Mr. Thompson, Norwich	0	5	0
Mr. Mann, Norwich	0	2	6
Anonymous	0	2	6
S. Cottam, Esq	1	1	0
L. Maclachlan, Esq., Manchester	2	2	0
Mr. P. Daw, Linlithgow	0	2	6
J. G. Gibson, Esq., Hexham	0	5	0
R. M. S.	0	5	0
Collected at a Meeting of the Edinburgh Photographic Society	6	0	0
H. & J. Walter, Lyme Regis	0	5	0
E. G. Roonin, Shipley	0	1	0
C. S. [illegible] Esq., Birmingham	1	1	0
Jo[illegible], Glasgow	2	2	0
[illegible] Esq., Glasgow	2	2	0
[illegible]grapher	2	2	0
[illegible]lasgow	1	1	0
[illegible], Glasgow	2	2	0
[illegible] Glasgow	1	1	0
[illegible] Brothers, Glasgow	1	1	0
[illegible]sq., Oxford-street	0	10	6
	£365	6	10

Mr. John Mayall, jun., son of Mr. Mayall of Regent-street, attended at Brook House on Saturday last, in the Isle of Wight, the residence of Mr. Seely, M.P., and in the course of the day took a sitting of General Garibaldi for a photographic portrait, with a view to publication. Although the notice given was unavoidably short, and the General did not disguise the reluctance with which he yielded to his friends in sitting at all, a very satisfactory result was obtained, the portrait being most characteristic of the General.

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CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

The continuation of Hermann Vogel's paper will be resumed in our next.

W. M. B.—The conclusion of the Jurors' Report is again unavoidably postponed. The Reports have been published by Bell and Daldy, but are out of print, and copies published by the Society of Arts at 10*s*. are now fetching from 30*s*. to 40*s*.

An Amateur (*Isle of Wight*).—If the pictures you send are approved of by the Committee of Selection, you will be informed of the same, and you can then forward the Post Office Order for one guinea; but it would be premature for you to do so at present.

A. H. and others.—The Exhibition will take place at the Gallery of the Society of Female Artists, in Pall Mall. That Society grants the use of the premises, just as the Society of British Artists, or Painters in Water Colours have done on former occasions. It is perfectly absurd to complain of such an eligible locality. There is a good separate entrance from the main thoroughfare, without any ascent of steps.

A. J. (*Queen Elizabeth's Grammar School*).—You will be proposed for election at the next Meeting of the Society, which will give you all the privileges of the Exhibition.

Letters of inquiry to the Editor can be answered only through the medium of Answers to Correspondents.

All Communications for the Journal should be addressed to the Editor, at the Publishers', Messrs. Taylor and Francis, Red Lion Court, Fleet Street.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 145. MAY 16, 1864.

PHOTOGRAPHIC SOCIETY.

The next Ordinary Meeting of the Session will take place at King's College, on Tuesday, June 7th, at eight o'clock, when Mr. Sydney Smyth, who was prevented at the last Meeting, will take a Solar Camera picture by means of the Magnesium Light.

Meeting of the Society, 1864.

Tuesday, June	7

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In accordance with the usage of all other Literary Societies, the Council of the Photographic Society have unanimously passed the following Resolution, to which the attention of Members and the public is especially called:—

> Resolved, "That all articles whatsoever shall, before being admitted to the public Meeting of the Photographic Society, be shown to the Council in their room at the Meeting at 6.30; and that this notice be published in the Photographic Journal."

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The Opening of the Exhibition.

We are sorry to say that intending exhibitors have in several instances delayed in sending in their pictures on the appointed days of reception. After Tuesday, the 17th, no picture which has not been received can be considered by the Committee of Selection, as the Exhibition will be opened during the following week.

LONDON PHOTOGRAPHIC SOCIETY.

Ordinary General Meeting.

King's College, London.

Tuesday, May 3rd, 1864.

The Hon. W. **Warren Vernon** in the Chair.

The **Secretary** read the Minutes of the last Meeting, which were confirmed.

The following Members were balloted for and duly elected:—

Miss Hurt, The Knoll, Derby.
Andrew Johnson, M.A. Trin. Coll. Camb., Grammar School, Horslydown.
E. **Aldis**, Esq., Arthur Grove, Kentish Town.
W. H. **Sandford**, Esq., Caroline Villas, Kentish Town.
R. **Murray**, Esq., Hoxton Old Town, N.
P. **Parsons**, Esq., Kenilworth Road, Leamington.
Edward Mulready Stone, Esq., Ashton Villa, Wickham Road, New Cross, S.E.
Samuel Sampson, Esq., Elmshurst, Finchley, N.
D. H. **Macfarlane**, Esq. (of Calcutta), North Bank, Regent's Park, N.W.

Mr. **Hughes**, Mr. **Cooper**, and Mr. **Macfarlane** exhibited fine specimens of photography.

Mr. **Dallmeyer** then exhibited a Photoheliograph he had just completed for the Russian Government, and read the following descriptive and explanatory paper:—

A Description of the Photoheliograph constructed by order of the Russian Government for the Observatory at Wilna, under the direction of Mr. Warren De la Rue.

By J. H. **Dallmeyer**, Esq.

The Photoheliograph consists
with object-glass, eye-piece,
mounted equatorially.

Figure 1 represents the equato
N, O is a pedestal of cast iron,

section of which resembles the letter Y, the angles being strengthened by several horizontal webs. The base of the pedestal, not shown in the sketch, has a considerable spread. Upon its summit, terminating in a horizontal triangular plane, rests the gnomon, X, Q, R, which supports the polar axis. The adjustments for latitude and azimuth are obtained by the screws *p p* and *n*. The polar axis S, of hard bell-metal, has its upper bearing in Y's, formed on the top of the gnomon, the friction being relieved by two rollers acted upon by the adjustable spring levers *d, e, f*. The lower part of the polar axis terminates in a steel point, which rests on the face of a steel pivot, freely sliding in a socket, and supported by a spring from below.

The right-ascension circle, U, is loose upon the polar axis, to which it can be attached by the endless screw *h*, mounted upon the bracket V, part of the polar axis, and can be thrown in and out of gear by the eccentric Z.

The right-ascension circle has two verniers, the lower one fixed to the gnomon, immoveable, the upper one attached to, and moving with, the polar axis, the circle being divided on both edges; the first indicates sidereal time, and the second the right ascension of the star observed. By this arrangement, first introduced by the present Astronomer Royal, objects can be found without computation. Immediately below the divisions, the edge of the circle is ratched and is driven by the endless screw *g*, which, being mounted upon the slide T (part of a rectilinear slide), can be thrown in and out of gear by the eccentric *m*. The other movement afforded by the slide serves to correct slight errors in the rate of clock, without deranging the previous adjustment of verniers.

M, D represent the clock—regulated by a friction-break, influenced by a double conical pendulum. A going-barrel, or maintaining-power, prevents the clock from stopping when it is being wound up. The weight of the clock descends down the acute angle of the pedestal, and nearly in the centre of gravity of the mass. The clock movement is communicated to the endless screw, *g*, by toothed wheels.

On the upper end, *y*, of the polar axis, S, is fastened the cradle C, which carries the declination-axis G—made of brass, cylindrical, and resting on Y's formed at each end of the cradle. A striding level can therefore be applied direct to the axis itself, for levelling, by the removal of the clips at each end.

E, F is the declination-circle, divided on the face, and ratched on the edge. A bracket H, fixed to cradle C, besides verniers *b b*, carries the endless screw, *a*, for setting the circle, and which can be thrown in and out of gear by an eccentric, not shown in the sketch. It may here be stated that all the endless screws used for driving or setting the circles are kept in gear by springs, thus preventing all loss of time in any of the motions.

To facilitate the reading of verniers, both circles are provided with suitable microscopes shown at *j* and *l*.

A, B is the telescope-tube attached to the flange of declination-axis, G, by two ring-clips K and L, held by the screws J, I. It is balanced by counterpoise *i*.

The camera A (fig. 2), of brass, about 20 inches long, suitable for plates 6 × 6 inches, is bolted to the flanged end of the telescope-tube B. Two handles, not shown in the sketch, allow of the telescope-camera being turned through an arc of 90°; the ring-clips which attach the telescope to the declination-axis are divided to this end.

The object-glass, D, of 3⅝ in. aperture and 50 in. focal length, corrected to combine the chemical and visual acting foci, screws into a tube, sliding freely into the telescope-tube, which affords an approximate adjustment for focusing on the cross wires, to be referred to hereafter. A ring-clamp E, with screw, secures it in this position. The fine adjustment is obtained by a sliding tube E (see figure 3), furnished with rack and pinion.

In the focus of the object-glass is placed a dovetailed slide with two circular openings, across one of which is stretched a fine wire cross; a picture can thus be obtained with or without cross wires.

The image of the sun formed by the object-glass upon the wire cross at *b, a*, where it measures about half an inch in diameter, is received by the eye-piece, or, more correctly, by a newly constructed enlarging lens C, which projects an image of about four inches diameter upon the screen B of the camera.

The exposure required to produce a collodion negative with the aperture of object-glass reduced to two inches is the smallest fraction of a second, and is effected by an instantaneous shutter, shown in Fig. 3.

The shutter B, situated between the wire cross and enlarging lens, where a minimum amount of motion will effect an opening and closing, is made of brass, and slides freely in a dovetailed groove of the plate A. Shutter B is held at its lower end by the spring *a*, the tension of which is under control of a screw. The arm D, with a pulley, supports the thread *b*, which at one end is attached to the shutter, and at the other to a hook, mounted on the camera. When the thread is burnt or cut, the shutter obeys the force of the spring and descends.

Fig. 1.

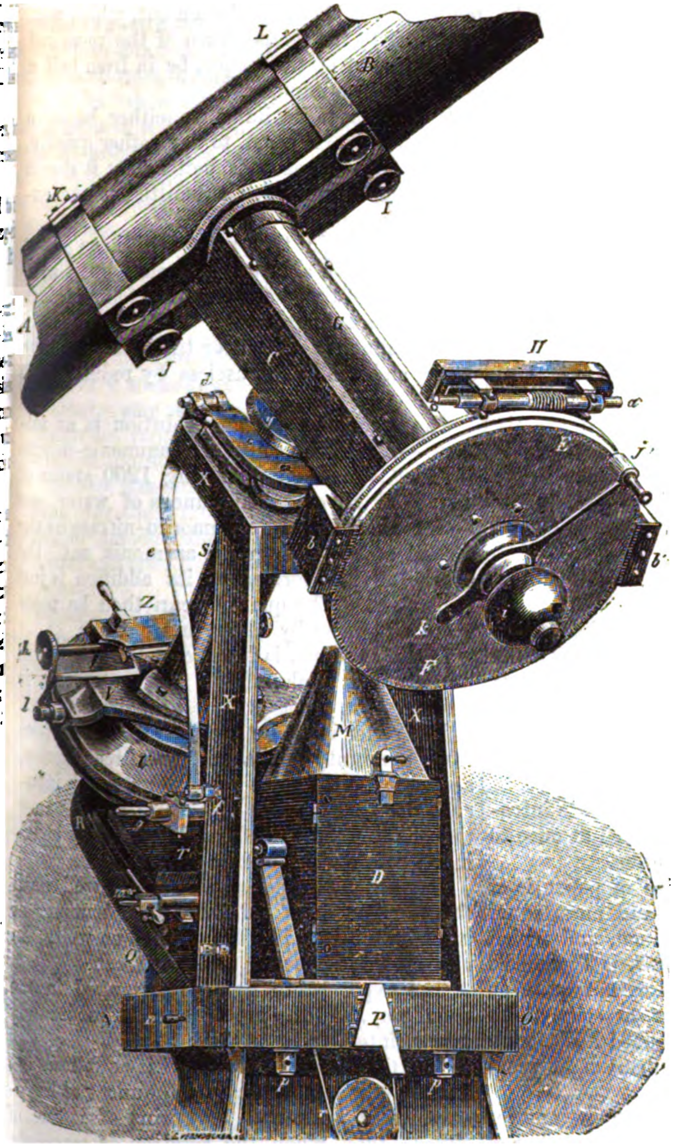


Fig. 2.

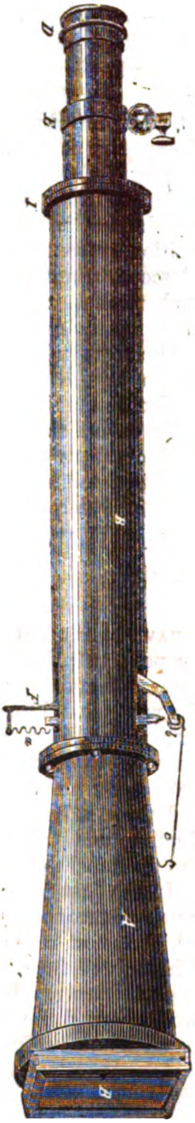
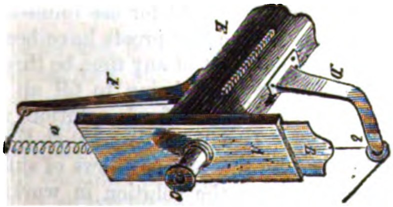


Fig. 3.



N.B. The above illustrations are from electrotypes, kindly supplied to Mr. Dallmeyer by Dr. Van Monckhoven.

Fig. 4.

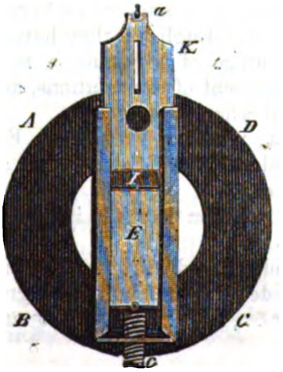


Fig. 4 shows the construction of shutter B. The shaded part I, about $\frac{1}{10}$ inch wide, is a slot or opening in the shutter, which can be enlarged or contracted by another slide, E, moving in dovetailed fittings, and acted upon by a screw with an index, accessible from without when the shutter is in position. The time of exposure is regulated by opening or contracting the slot at any moment. The shaded circle above the slot represents an opening in the shutter, which, when made to occupy a position concentric with the optic axis of the telescope, admits the entire cone of rays to pass unobstructed, thus forming an image of the sun upon the screen, necessary for focusing.

The perpendicular slot, with a pin, not shown in the sketch, controls the extent of motion of the shutter.

To ensure the image being formed exactly on the centre of the screen, a finder-lens is fixed to the outside of the telescope-tube, in the focus of which is a divided ivory scale.

Mr. T. H. Hennah then read the following paper on

Positive Printing.

I have been often asked to publish the process for positive printing which I have with much success adopted for the last ten years, and as the professional and other reasons which have hitherto withheld me have not now their old force, I have much pleasure in bringing it before you tonight.

I think it better to avoid an elaborate introduction, and will therefore proceed at once to the technical details of the process.

In the first place, the choice of paper is of much consequence; the best and most equal which can at present be obtained, and which I have used for some time past, is Towgood's positive paper. It is, however, not quite so well adapted for the process as some thick paper made by Turner of Chafford Mills, with a manuscript mark, and sold about eight years since by Woolley and Co.

The French and German papers answer well, and yield proofs of great contrast, but of less delicacy of tone and atmosphere than we obtain with the English; they have, besides, the disadvantage of requiring a much more careful adjustment of the solutions, and do not keep so well when prepared.

No paper, whether French or English, is suitable unless it will stand the action of boiling water.

The first solution is made in the following manner:—

Chloride of gold	60 grains.
Chloride of ammonium	120 grains.
Water	20 ounces.

This is to be applied by floating in the ordinary manner, and the paper is to be allowed to remain until it begins to flatten out, which will, according to the temperature of the room and the character of the paper, be in from half a minute to two minutes.

It is then to be hung up, either before a fire or in a warm room, to dry rather quickly, but not entirely, as it is better that it should be slightly damp when submitted to the exciting solution.

The paper in this state will keep about twelve hours in a darkened room; but I have always found that better results follow if it is excited more immediately.

The influence of light or time discolours the paper, and renders it useless by reducing the gold.

The second or exciting solution is as follows:—A 60-grain solution of ammonio-nitrate of silver is made by dissolving 1200 grains of nitrate of silver in 15 ounces of water, and then converting it into ammonio-nitrate by the careful addition of strong ammonia until the precipitate first formed on its addition is just redissolved. The quantity can then be made up to 20 ounces by adding more water.

If the ammonia is in excess, the proofs will be grey and weak; if, on the contrary, it is deficient, the proofs will be bronzed and hard.

The paper is to be floated on this solution from a minute and a half to three minutes, according to the same conditions which influence the time on the first solution. It must then be thoroughly and quickly dried by hanging it before a fire or in a warm room.

In winter the paper will work well until three or four days' old, but in the summer or in damp weather it will not keep so well. In either case it is better to use it fresh.

The exposure to light is arranged in the usual way, and the proofs must be moderately over-printed.

The third or fixing solution is as follows:—To 20 ounces of water add 5 ounces of hyposulphite of soda and 14 grains of iodide of silver; then, when the solution is complete, add 1 ounce of the 60-grain ammonio-nitrate-of-silver solution.

This mixture is fit for use immediately, but improves after a few proofs have been fixed in it. It should not at any time be thrown away, all that is required being to fill up the vessel containing it with fresh solution every day after use. It will be found that the quantity absorbed by the proofs allows of sufficient renewal to keep the solution in working order. It should smell strongly of ammonia, and if, from being out of use, the ammonia should have evaporated, a small quantity must be added.

In ordinary use the proofs themselves sufficiently compensate for the evaporation.

After exposure the proofs must be immersed without washing in the fixing solution, and are to be allowed to remain one hour; they are then to be taken out, drained, and laid in a single layer in a flat dish, when boiling water must be poured upon them; a fresh layer of proofs is laid upon them, and is then treated in the same way, and so on with the rest, giving boiling water to all. In about five minutes the water is to be drained off and a fresh supply of boiling water added. It is as well to repeat this a third time—in fact it is almost necessary.

The washing can afterwards be completed by successive washings in boiling water, or in the ordinary way with cold water.

The proofs, in consequence of the complete removal of the size, are very tender, and are best dried by hanging over glass rods.

When dry they are to be laid face downwards on glazed bibulous paper, and then ironed with an iron hot enough almost to scorch the paper.

The proofs will now by their colour indicate any errors of the process which can affect their permanency, except that of insufficient washing.

If the hyposulphite has been adulterated so as to lessen its solvent power, the iodide of silver will be precipitated in the proofs. In this case more hypo must be added, as must also be done when foreign papers are employed. Papier Saxe works better with only 10 grains of iodide of silver, and is, besides, better when the quantity of gold is reduced to 40 or even 30 grains.

If the lights in the proof are in the slightest degree altered from the original colour of the paper, it should be destroyed as unsafe.

An experience of about ten years without any modification of the formulæ justifies me in saying that proofs by this are at least as lasting as those by any other silver process. It depends for the permanency of its results almost, if not altogether, on the completeness of the washing, all other faults, as I have said, being shown at once by altered colour in the lights.

I expect to be met by objections to the use of the old fixing bath, and will therefore endeavour to anticipate them by stating that I have been unable by the most delicate tests to discover anything whatever which can be hurtful in the darkened portions of the proofs, and nothing at all but the paper in those parts which have remained white after fixing.

In conclusion I may state that this process has been arrived at in a purely experimental manner, involving in its different parts things already well known to us, and is the result of suggestions which have been hitherto fruitless in consequence of their incompleteness. I can particularly instance that of Professor Maconochie, whose directions for the preparation of the paper* are almost the same as mine, except in the want of a definite proportion of gold. He gave no fixing solution, and as the paper prepared with gold requires one specially adapted, his valuable suggestion has been forgotten. To him, however, is really due much of the merit of the process I have this evening submitted to you in a complete form. The certainty of the results and the delicate neutral tone forming its chief claim to notice would, however, have been wanting without the iodide of silver and ammonia employed in the fixing solution.

The CHAIRMAN read the following letter, received from M. Placet, which we give in the writer's own words, that our readers may judge of the claim made. Below will be found Mr. Swan's reply:—

Paris, 24 Avril 1864.

A Monsieur le Président de la Société Photographique de Londres.

MONSIEUR LE PRÉSIDENT,—A la dernière réunion de la Société Photographique de Londres, Mr. Swan a fait connaître un nouveau procédé au charbon, dont les journaux anglais ont fait grand éloge.

Permettez-moi, Monsieur le Président, de transcrire, à cette occasion, un passage du mémoire présenté par moi à la Société française de Photographie, le 4 Décembre 1863, sur mes procédés de *gravure* photographique.

Extrait du Bulletin de la Société française de Photographie, 4 *Décembre* 1863, p. 329.

" . . . . . . Sur une *glace* on étend une ou " plusieurs *couches de collodion*, puis une *couche* " *de gélatine bichromatée*; après *dessiccation*, on " *coupe les bords* de la gélatine et la feuille de " *gélatine se détache* facilement, emportant le " *collodion* qui *fait corps* avec elle.

" On expose à la lumière sous un cliché du " *côté du collodion*, puis, sur cette même *face* " *collodionnée*, on pose une plaque de métal " enduite d'une matière *agglutinative* et l'on " fait passer entre les rouleaux d'une presse; " la feuille se trouve alors parfaitement *fixée*, " la face de gélatine non *impressionnée en dessus* " et dans les *conditions voulues* pour être soumise " à l'action du *dissolvant*.

" Une seule couche de collodion sur la glace " ne suffirait pas toujours pour détacher facile-

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* Given in a letter to Mr. Fenton in No. 7 of the Journal of the Society, July 21st, 1853.

"ment la feuille de gélatine. Le collodion peut "d'ailleurs être remplacé par toute autre sub- "stance jouissant de propriétés analogues. . . " . . . . . . etc. . . . ."

En rapprochant de cette citation la description de Mr. Swan, il est aisé de voir que Mr. Swan a copié textuellement dans mon mémoire la partie importante de son procédé.

Mr. Swan ne peut invoquer son ignorance de mes procédés, puisqu'il en parle et me nomme dans une note antérieure à sa communication et publiée dans la Revue photographique anglaise.

Je vous prie, Monsieur le Président, de vouloir bien communiquer cette réclamation à la Société Photographique de Londres, et de la faire publier dans votre estimable journal.

Veuillez agréer, Monsieur le Président, l'assurance de mes sentiments respectueux.

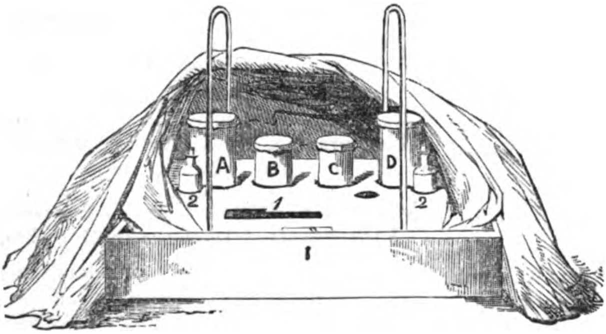
EMILE PLACET, *Ingénieur Civil.*

Mr. SKAIFE then exhibited his drawing-room photographic cabinet, and read the following paper:—

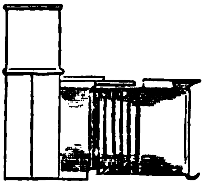
WHEN photography is as old an art-science as that of music, we shall doubtless have as great a variety of photographic instruments as we now have of musical ones, and as fair a proportion of lady-actinists as we now have of fair pianists—when a young lady's education will not be considered finished until she has attained to some practical knowledge of the artistic properties of light; and until then it will be vain to look for some of the most charming and exquisite effects of which light's actinism is capable.

In almost every department of the graphic art photography has triumphed, excepting in one—the delineation of childhood in its home-aspect; nor will, I am persuaded, success be attainable in this *genre* until those most competent to effect it—themselves—undertake the task.

The anxiety of fond parents to possess likenesses of their children has induced many photographers to attempt the difficult undertaking; and though by various ingenious *ruses* a likeness of a child, in some shape or form, may be obtained, yet at best such falls far short of what a mother wishes to see realized in a likeness of her child; and considering the trying ordeal of failures through which the artist has passed to obtain so dubious a success, it is not unnatural for him to regard the *entrée* of one of those dear little trot-trots into his glass-house as a calamitous invasion, especially if his waiting-room at the time happens to be filled with a well-regulated though impatient *clientelle* of grave and reverend seniors waiting their respective turns to be *carted.*



Pistolgraph Cabinet.



Pistolgraph.

But that which is desperation to a professional, whose "time is money," would be mere "child's play" to one whose chiefest occupation was her child, whose chiefest care was to train the tender plant in whose future was centered her every hope and fear. To such a one ninety-nine failures to obtain a likeness would not be regarded as love's labour lost, if at the one-hundredth attempt an appearance was secured which would recall a happy reminiscence when the original was doing, or had done, a page in history.

The five or six years' experience I have had of children under photographic manipulation has germinated a conviction which has finally developed itself in the shape of this cabinet, containing an apparatus constructed in accordance with four conditions.

1stly. To enable a lady, without any foreknowledge of photographic manipulation other than can be readily acquired by a person of ordinary intelligence in some fifteen or twenty minutes, to take a likeness of a baby or other domestic pet with as much ease and comfort to herself in her own drawing-room or boudoir as she could sit down to do a piece of embroidery or other needle-work.

2ndly. That in no part of the operation of taking a picture shall the operator's hands or dress be exposed to any of those objectionable stains so discouraging to amateurs.

3rdly. That in no part of taking or finishing a picture shall the operator be necessitated to enter a dark room, or place her head under a hood or bag of any description.

4thly. That the apparatus shall not only be portable, but shall admit of being easily and expeditiously arranged for operation, and, when done with, as easily and expeditiously put away as a lady's work-box or writing-desk.

How far these conditions have been adhered to, an inspection of the cabinet and its contents will enable you to judge.

On lifting the lid, and unfolding an inside velvet cover, the whole apparatus is disclosed in position ready for use: consisting, firstly, of a little brazen instrument, with the brazen name of pistolgraph; secondly, a half-ounce bottle of collodion; thirdly, a row of four porcelain jars with gutta-percha covers, lettered A, B, C, and D. A contains a dozen glass plates, two and a half inches long by two and a quarter broad; B, two ounces of nitrate of silver bath; C, two ounces of iron developer; D, two ounces of salt and water.

First operation.

Though this cabinet is expressly designed for the use of those whose domestic and maternal duties necessarily keep them much at home and in the society of their children, it does not follow but that it may be made available by the other sex as easily as a lady's piano. Might it not serve the purpose of one whose professional or business engagements prevent his devoting much exclusive attention to the art, on his finding what little forethought or practice in photographic manipulation was necessary in order to obtain therewith a valuable reminiscence of home, executed by himself, whilst waiting for next train or until his horse was saddled?

Of the few examples of pistolgraph productions, those from negatives, in the shape of small *cartes* and a couple of enlarged reproductions, were taken by one of my licensees, Mr. Groom, of Plymouth.

The positives are by myself and assistants, some being plain pistolgrams, others chromocrystallized. The latter are variously finished, some on enamelled capsules of silver and gold, representing, as it were, likenesses imbedded in ruby, emerald, sapphire, or amethyst. As a rule, however, our patrons prefer plain pistolgrams to the chromocrystals.

Mr. Skaife exhibited the mode in which the manipulations might be conducted with one hand in the dark cabinet, guided by the sense of touch only, and took a photograph of the gas-lamp. He also exhibited a number of the small glass positives known as pistolgrams, chromocrystals, &c., mounted in various ways, some of them to imitate a portrait imbedded in a precious stone. Also some small paper pictures, and some enlargements taken by his pupils or licensees.

Mr. Hughes asked, to what the rapidity of his instrument was attributable—to the process used or the lens employed.

Mr. Skaife said, it was due to the construction of the lens, which gave extraordinary rapidity. Ordinary stereoscopic lenses would give instantaneous results in a good light for outdoor work; but for taking the portraits of very young children in the dull light of a room a much higher degree of rapidity was necessary, and the best form of lens had been obtained by pursuing a careful series of experiments. It was about one-twentieth quicker than the extra-quick lens of Voigtlander.

Mr. Hughes asked if it might be used for other cameras besides the pistolgraph.

Mr. Skaife said, it was constructed specially for the pistolgraph. Besides the peculiarity of its curves, &c., it differed from the ordinary portrait-lens in having no separation between the two glasses of the back combination. The lenses were made for him by Mr. Dallmeyer according to a design supplied.

The Chairman then announced that he had received a letter from Mr. Sydney Smyth, regretting that he was unable to produce a solar-camera picture that evening with the magnesium light, as promised, as he could not procure a supply of the wire. He hoped to be able to do it at the next Meeting.

Votes of thanks to Messrs. Dallmeyer, Hennah, and Skaife were then passed; and the Meeting adjourned until the 7th of June.

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To the Editor of the Photographic Journal.

Newcastle, May 8, 1864.

Sir,—I beg to thank you for sending me a copy of M. Placet's letter. All I can say in reply is, that M. Placet does me great injustice in supposing that I have borrowed any ideas from him.

He is mistaken in supposing that I have read his patents. All I know of his memoir on photographic engraving is derived from a *résumé* of it contained in a letter of M. Lacan, which, I believe, appeared in one of the January Numbers of the 'British Journal of Photography;' and it was immediately on reading this letter that I made the communication to Mr. Simpson in which M. Placet's name is mentioned, and to which he refers. The object of that communication was to state that the process of photographic engraving which M. Placet was proposing as new, was not new to me, but that I had long before made chromo-gelatine reliefs exactly in the manner he described, and had, moreover, gone much further than (as far as I could judge from M. Lacan's abstract) it seemed he had gone; that is to say: I was not merely able to produce blocks for relief-printing and plates for intaglio-printing from *line originals*, but, besides this, plates *from the round*, and from which the copper-plate printer could take impressions having *half-tone* like a photograph. My experiments in this direction have been unavoidably interrupted; but I yet hope ere long to substantiate to the public the statement that I then made and have here repeated.

As to *carbon printing* (which, by the way, is quite another thing from *photographic engraving*, to which subject I believe M. Placet's memoir exclusively refers), I and others have in our possession carbon prints that were made *according to the process I have published* at least *two months before M. Placet published his memoir on photographic engraving.* I therefore most emphatically assert that, whatever similarity there may appear to be between some of the details of his process of photographic engraving and my process of carbon printing, that nevertheless those details have been originated and developed quite independently of him, and long before the publication of his memoir. Yet I cannot forbear to remark that, supposing (which is, however, quite contrary to the fact) I had not made a single carbon print before the publication of M. Placet's memoir, still I think that would scarcely have lessened the originality of my process of *carbon printing*—a thing perfectly distinct from photographic engraving, the subject to which M. Placet's memoir is confined.

I shall feel obliged if you will communicate the contents of this letter to the Society at its next Meeting; and you will further oblige me by allowing my letter to appear in the Society's Journal. Joseph W. Swan.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

Annual General Meeting,

held in

The Society's Hall, 117 George Street,

May 10, 1864.

C. G. H. Kinnear, Vice-President, in the Chair.

The Minutes of the preceding Meeting were read and approved.

The Honorary Secretary read the following communication:—

On a New Arrangement for Washing Photographic Prints.

By James Abbot, Photographer, Dundee.

I have been advised by several of my professional brethren to give to the Society a description of an arrangement which I have devised for effectually washing photographic prints.

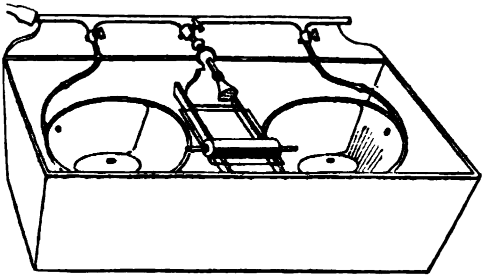
During the last two years there have been several very good methods proposed for accomplishing the end in view; all of them, however, will, I fear, be found deficient, if put to sufficient test.

In most of the systems of washing which have been proposed, the prints are submitted to plentiful changes of water; and in the best of these there is a continual agitation so as to prevent the sheets from adhering together.

In the arrangements which I have the honour to submit to you, we have a continual change of water, together with an incessant movement of the prints, not in a mass (which is very likely to happen in other methods which I have seen), but in such a manner as to make one believe that each print is under restriction not to touch its neighbour. I have also adopted a method which, I think, will find much favour, namely, that of pressing or squeezing the pictures while under washing.

We know that paper is a spongy material, being composed of a mass of fibres matted together. Now, if we take a piece of close sponge and soak it in colouring-matter, such as a solution of indigo, and put it into a vessel full of water, and submit it to many changes, say for the space of one hour, it will still exhibit colour at the end of that time on being pressed or squeezed. This shows that squeezing may form a highly important part in the process of removing soluble substances from spongy bodies. In a print while washing, I believe that the action of the fixing agent on the unchanged chloride of silver, &c. (in the case of prints on albuminized paper), must, for the most part, be exerted through the mass of paper from the back or unalbuminized surface; and that the latter surface, owing to the closeness of its texture, must in great measure prevent ready action of the hyposulphite of soda. I have been much surprised to find that an extremely small amount of the intensity of a sufficiently exposed picture exists in the albumen-film, and on this account frequently thought that a process of washing which, with safety to the print, would admit of the paper being manipulated as one would a sponge charged with colouring-matter, would effectually remove all the soluble matter from the substance of the paper.

I have said sufficient on the merits of my arrangement; and much more than this for those present at this meeting would not be necessary, seeing that I have put before you a working model. I shall, however, describe the full-size arrangement which I have in operation, and the method of working it.



In a convenient part of the fixing-room I have erected a wooden trough, which is so constructed as to be quite water-tight. In size this trough is 6 feet long at both top and bottom, and in breadth 2½ feet at the top and 2 feet at the bottom. Its depth is 18 inches. These are inside measurements. This trough is raised from the floor on a frame, and the height from the top of the trough to the ground is 3 feet 2 inches. The trough has a hole in one end of the bottom for the insertion of an exit pipe, and a very slight fall is given towards this end. At 3 inches from the bottom of the trough, at each end, there are two wooden bars placed (12 inches apart) across, to support two earthenware vessels which are to be placed at each end. These dishes are in size 20 inches in diameter and 10 inches deep, and have three holes pierced in each of them—one at the bottom, in which must be fitted a piece of gutta percha while soft, so as to form a plug opening upwards, and the other two at either side of the dish, halfway down. The holes in the side are for the entrance of the water, to be afterwards referred to.

On the top of the trough, in the middle, is fitted a wooden frame, which receives a piece of very thick plate glass, 14 inches square; and this is rounded at the edges. This glass table is firmly fixed to the frame.

To press the sheets I have a roller made thus:—A brass tube, 14 inches long and 1½ inch in diameter, is covered with a piece of india-rubber tubing. This covered tube is pierced by a spindle terminating at each end at 3 inches beyond the brass tube, and so formed as to be a convenient handle. Now along the back of the trough, and 6 inches above it, I have my water-supply pipe. This pipe is half an inch in diameter. From this I take three branches, one to the large dish on the right hand, and another to that on the left, and the third is made to terminate a short distance above the glass table in a rose-head similar to that attached to a garden watering-pan.

This should be sufficiently above the glass slab to cause the water which rushes out from it to play over the whole surface of the glass. The branch pipes are ⅜ inch in diameter, and each of them has a separate stop-cock attached at a point a little from the main pipe.

To supply the dishes with water, each branch is divided into two, and these enter the basins from the outside, and are made to fit closely, entering about ¼ an inch into the interior of the vessel, which is for the purpose of enabling the current of water to be directed towards the side of the dish. When this arrangement is adjusted, it will be found that the opposition-jets of water cause a thoroughly screw motion in the water, which is the most effectual in my experience for keeping the prints apart and in continual motion.

The working of the arrangement is very simple. I conduct it thus:—The prints, being fixed, are put into, say, the dish on the left hand. The plug, being in the water, is put on, and they are turned about by the screw-motion for an hour; or if there is a large number of prints, I divide them and put into both dishes. At the expiry of this time, I lift them one by one and place them, backs up, upon the glass table until it is covered; I then put on the water, and take the roller and give six or eight turns over the prints, pressing the while pretty firmly. They are now to be transferred to the dish on the right-hand side, which is full of clean water.

In this vessel the prints can be left until they are considered finished, and all that it is advisable to do is to remove the plug at the bottom two or three times. The arrangement, beyond this, requires no watching, as the prints will never attempt to go over the edge of the basins. I generally finish by a washing of six hours' duration; but I am quite convinced that a treatment of three hours would be quite sufficient, and especially if the pictures were brought twice under pressure. The washing away of the hyposulphite of silver should be accomplished as quickly as possible, as it is very liable, when in a diluted state and in the presence of very little free hyposulphite of soda, to decompose spontaneously. I consider this to be a powerful argument for a reasonably rapid washing; and it is very likely that the paper is in a sufficiently soft state, by the previous operations it has gone through, to permit this being accomplished in from three to four hours.

This, gentlemen, is as much as I think will be necessary in the way of description. I might have, as I intended, proved to you by chemical test the comparative efficiency of this method and that ordinarily followed. But, in the absence of this proof before you, I may say that I subjected two prints (one washed in the usual manner, and the other by the rolling method) to a severe test after a washing of half an hour, and the result was as distinctly as could be in favour of the rolled print. In order to ascertain correctly whether the hyposulphites are removed from paper quicker and better by one system of washing than by another, it is not enough to test the water that drips; it is necessary to bruise the paper to a pulp, and soak this in a test-glass with a small quantity of cold distilled water for an hour or two, when, by pressing down the pulp with a glass rod, the liquid can be poured off for testing.

It is to be hoped that, ere long, anything like uncertainty as to permanence will be unheard of, by the method at present followed being superseded by one about which there can be no doubts. But, until then, it is our duty to do the utmost in our power to secure as far as possible this most desirable condition.

After the reading of the paper, a discussion arose as to the value of Mr. Abbot's apparatus, which was generally approved of, Mr. Tunny, however, still advocating the use of *hot water* as the most effectual means of securing permanency in photographic prints. Mr. Tunny moved that Mr. Abbot receive a vote of thanks for his instructive communication.

Mr. T. B. JOHNSTON then read the following

Notes on Carbon Printing.

MY attention has been called by Mr. Rodger, of St. Andrew's, to the similarity that exists between Mr. Swan's carbon process and that by M. Poitevin as afterwards modified by M. Fargier, for which he received a medal of 600 francs from the French Committee in July 1856.

In the 'Photographic News' for Dec. 14, 1860, I find, under the head of "Foreign Science," the following from their Paris correspondent:—

"M. Fargier has patented a new printing-process; but yet not entirely new, inasmuch as he avails himself of the photogenic action of light on a mixture of gelatine and bichromate of potassa, with the addition of carbon in powder.

"His method is based on a very simple but important fact, viz. that when a transparent sensitive medium is exposed to light, the chemical action and change, commencing at the surface of the sensitive medium, penetrate more or less into its substance in proportion to the length of time it is submitted to the action of the light. Consequently, when he has obtained a picture on a layer of gelatine, containing powdered carbon in a state of suspension, and sensitized by bichromate of potassa, M. Fargier pours some collodion on to this picture, and then plunges the plate into warm water. The glass becomes detached, the gelatine melts, *under the image*, and there remains on the collodion only those portions of the bichromate, more or less thick, according to the intensity of the light, and which have become insoluble. In this way the picture is really transferred to the collodion in all its detail; for the surface remains exactly as the light has made it. The picture is next glued to a sheet of paper, collodion *uppermost*. In this way M. Fargier obtains positive pictures so fine in model and tone, that proofs taken from the same negatives by ordinary methods cannot be compared with them."

On the 19th of December, 1860, he writes, "In my last letter I described M. Fargier's process of carbon printing: the results are truly admirable, both from the purity of the lights and the delicacy of the details of the image, very superior to the positives obtained by the ordinary methods; being printed with pure carbon, they are undoubtedly permanent."

In the 'News' for January 3, 1862, the Paris correspondent writes, "M. Fargier has made some important modifications in the original process: he found the sensitiveness of the bichromate of potassa so great that one or two seconds' exposure was sufficient to solarize the proof; he then substituted nitrate of uranium, bichromate of ammonia, &c., for the salt of potassa, and then obtained better results. The exposure could then be prolonged several seconds without danger. The manipulation of the collodion-films is also performed with much more freedom."

Mr. Rodger says, "The only difference between this process and Mr. Swan's is, that M. Fargier prints on the film of gelatine and carbon, and then pours on the collodion, and thus draws the film off. From my experience of the last month, I should rather follow the details of this process in preference to those of Mr. Swan's, and print while the material is flat on the glass; for I find that the film of gelatine is very apt to adhere to the printing-frame-back by reason of the heat."

Mr. Rodger, two or three years since, made a series of experiments by this process. Many of the prints so produced were quite perfect, but, unfortunately, not being preserved with sufficient care, very few of them now exist. He sends me one impression, not a perfect one certainly, but it is enough to prove that prints, by a process very similar to Mr. Swan's, were produced several years since.

Those who desire more information on the subject will find full particulars in the following Journals:—'Photographic News,' Dec. 14, 1860, Dec. 21, 1860, Jan. 11, 1861, Jan. 3, 1862; 'Photographic Notes,' Nov. 15, 1861, June 1, 1862; 'Journal of Photography,' June 2, 1862.

Mr. TUNNY exhibited to the Meeting several portraits printed by him, with slight modifications of Mr. Swan's carbon process. The prints were of good quality, equal to those produced by silver; and Mr. Tunny thinks, with a little practice, carbon prints can be produced with certainty and great rapidity; he advocates the use of a much thinner film than that recommended by Mr. Swan.

The SECRETARY then read the following Report by the Council:—

The Council, in accordance with the Laws of the Society, have now, at the conclusion of the Eighth Year of its existence, to present their Annual Report to this Meeting.

The Council have much pleasure in congratulating the Members on having obtained the consent of His Royal Highness The Prince of Wales to be the Patron of the Society, in room of his late father, the lamented Prince Consort.

The Council, on the other hand, regret that so few Ordinary Members have been added to the list since last Annual Meeting. They think it their duty to remind the Members that no Society can long continue to prosper without a constant accession of new Members, to fill up the blanks which must arise from deaths and resignations. They would therefore urge upon the Members the necessity of recruiting their ranks by endeavouring to induce all their friends who take an interest in photography to join the Society.

The papers read during the Session have been more than usually interesting, and the attendance has been satisfactory.

It may be of use, as a guide to future operations, to remind the Society of what has been done during the Session, which closes to-night; and the Council therefore present a short *résumé* of the business which has been brought before the Society, the chief communications being as follows:—

Some Remarks on the Malt Process; by the Rev. D. T. K. Drummond.

On the Stereoscopic Relief of the Chimenti Pictures; by Sir David Brewster.

Carbon Printing on Plain Paper; by Mr. W. Blair.

On the Photo-microscope; by Sir David Brewster.

Description of an Improved Enlarging Camera; by Signor Antonio Montagna.

On a New Camera, and Dry-Plate Apparatus; by Thomas Sutton, B.A.

On the Use of Magnesium Wire in Combustion as a Photographic Agent; by Sir David Brewster.

Description of a New Washing Apparatus for Photographic Prints; by Mr. John Sang.

Popular Notes on Photographic Lenses.—Part II. Landscape and Architectural Lenses; by Mr. J. T. Taylor.

Description of a New Arrangement for Washing Photographic Prints; by Mr. James Abbot.

The Council may also refer to the experiments of taking portraits by the new light produced by the combustion of magnesium wire, which were conducted at a late Meeting by Mr. Moffat. Although these experiments were quite successful, this brilliant light, for many reasons, can never compete with daylight for portraiture; but, on the other hand, it may be of great value to illuminate dimly lighted interiors; for taking copies of paintings which cannot be removed from the walls; or for taking views in the interiors of mines, caves, or other situations where daylight scarcely enters,—such as the temples at Elephanta, or the interiors of the Pyramids.

The most important discovery of the Session has certainly been that of Mr. Swan's improved Carbon Process, which seems to combine all the beauty of silver printing with the permanency of printing-ink. Through the kindness of Mr. Swan, specimens of his new process were lately exhibited to the Society, which has ever taken a deep interest in the discovery of a permanent process, and has already awarded a medal to Mr. Pouncy, as well as been the medium of publishing a description of Mr. Blair's plain-paper carbon process.

The Competitive Exhibition of this season was the means of bringing together a number of beautiful prints, sent from every part of the country—a proof that a medal from this Society is valued as one of the highest rewards a photographer can attain.

The Exhibition was open for one month to the public, free of charge; and it must be gratifying to the Society that the Exhibition Rooms were well attended, and that many regrets were expressed when the Exhibition was closed. The gentlemen appointed by the Council to award the prizes were unanimous in their opinion as to the merits of the pictures selected for rewards, which were as follows:—

For the best Landscape the Silver Medal

was awarded to Mr. P. Robinson, of Leamington, for the "Deer Park, Stonleigh;" and Mr. Robinson also carried off another Medal for the best Group, "Somebody's Coming." Mr. Moffat, of Edinburgh, was the successful competitor for the best Portrait, that of "George Harvey, R.S.A.," for which he received a Silver Medal.

A Bronze Medal was awarded to Mr. F. Bedford, of London, for his view of "Warwick Castle;" and another Bronze Medal to Mr. Rodger, St. Andrews, for his Group of "Colonel and Mrs. Maitland Dougal."

The Council have entered into an arrangement with Mr. Robinson for the supply of copies of the Prize Group, "Somebody's Coming," which will be delivered to all Members of the Society who have paid the current year's subscription, as soon as the required number can be printed.

Successful as the Competing Exhibitions have hitherto been, the Council are unanimous in their opinion of the desirableness of having next season, if at all practicable, a General Exhibition. They find that a comparatively small number of photographs, however high in quality, has not the same attraction, either to the public or the Society, as a more extensive collection; whilst the fact of its being a Competing Exhibition excludes many pictures of undoubted merit, which would be sent without hesitation to an open Exhibition.

The only obstacle is the want of a suitable room in a good locality; and the Council call upon every Member of the Society to assist them in overcoming this difficulty, so that arrangements may be made in good time for next Session.

For next year, the Council would recommend that Silver Medals be awarded as follows:—

For the Best View, taken by a dry process; the details of the process to be communicated to the Society.

For the Best View, taken by an Amateur, by any process.

For the Best View in Scotland, taken by any process.

For the Best Group.

For the Best Portrait.

The Council to have the power of awarding extra Medals for any picture of sufficient merit, which may not have been included in the above list.

All the pictures must be untouched, and from single negatives, except in the case of Views, which may have the sky printed from another negative, or they may be toned or shaded before fixing.

As required by the Laws of the Society, the President, the Senior Vice-President (Mr. C. G. H. Kinnear), the four Senior Members of Council (Messrs. Scott Elliot, the Rev. Mr. Drummond, Mr. George Moir, and Mr. J. G. Tunny), the Honorary Secretary, and the Honorary Treasurer retire upon this occasion, but are re-eligible.

The Council would suggest that the President be re-elected; that the Rev. D. T. K. Drummond be elected Vice-President, in room of Mr. Kinnear; that the Secretary, Treasurer, and the other Members of Council be re-elected; and that Mr. Kinnear, the retiring Vice-President, be added to the Council.

Abstract of the Honorary Treasurer's Account.

From the account of the Honorary Treasurer which, with the docket of the Honorary Auditor certifying its accuracy, was laid before the Meeting, it appears that—

The sum of the Charge is......	£555	2	8
The Discharge is	230	0	1
Balance in favour of the Society.	£325	2	7

Mr. FINDLAY ANDERSON moved that the Report be approved of. It was a very encouraging thing to find that the funds of the Society were in such a prosperous condition.

The CHAIRMAN said that, before concluding the business of the Session, he had the agreeable duty to perform of proposing a vote of thanks to the Honorary Secretary and Honorary Treasurer for the very efficient manner in which they had discharged their duties. It was to the exertion of those gentlemen that the Society was indebted for its present efficient and prosperous state.

Office-Bearers for the ensuing year.

Patron.—His Royal Highness The Prince of Wales.

President.—Sir David Brewster, K.H., F.R.S., &c.

Vice Presidents.—Horatio Ross; the Rev. D. T. K. Drummond.

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Honorary Treasurer.—H. G. Watson.

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The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors.

No notice can be taken of anonymous communications. Whatever is intended for insertion *must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith. The same proviso extends to communications to the Editor.*

Improved Photolithographic Process.

To the Editor of the Photographic Journal.

3 Rue de la Pompe, Brussels,
April 30, 1864.

SIR,—Desirous of participating in the Exhibition of the Photographic Society of London, I have the honour of sending specimens of my new patent process of photolithography.

I have thought it would not be uninteresting to the members of the Photographic Society to give some account of my process and its history.

Some months ago I had the pleasure of showing to some gentlemen in London the excellent results I had obtained by Mr. Asser's process (our firm having obtained the privilege of working that process in this country). The practice of that process led me to think that something more simple and practical remained to be discovered; and by the very difficulties of Mr. Asser's method I was insensibly led to another way of operating, which I shall presently explain to you.

Having succeeded far beyond my expectations in improving the art, I communicated to Mr. Asser the results of my labour, and, by mutual consent, our two processes have become inseparable, though we are each patented in our own names, my patent being completed in England, France, and Belgium. I take the liberty of explaining to you my method without reserve; and should it be thought worth the Society's notice, I shall feel much flattered. It is as follows:—

Photolithography.—From a negative on glass or paper I take an impression on paper prepared in the following manner:—

Sized paper, very smooth and even in texture, is coated with a solution of gum arabic in pure water, saturated with bichromate of potass or ammonia. It is well known that the above substances, in combination with organic matter, such as gum, gelatine, dextrine, starch, &c. &c., become insoluble in water after a certain exposure to light. The paper, prepared as above, is then exposed behind a negative; and when the photographic image is sufficiently developed, there will be parts of the gum impregnated with bichromate which have *become insoluble, or partly so, exactly according to the gradations of tone in the negative employed.*

The sheet of prepared paper, with the photographic image thus printed, is placed face downwards on a lithographic stone, grained very fine or polished (according to the nature of the subject), and previously disposed in a percussion press (it can be done in the lithographic press, but with uncertainty); damp paper is then placed above the proof, and a heavy pressure applied. The water contained in the damp paper is pressed through the sheet impressed by light, *and dissolves the parts of gum remaining at liberty*; the gum consequently attaches itself to the surface of the stone. When the stone has remained a certain length of time in the press, sufficiently to allow the small quantity of soluble gum in the dark shadows to attach itself to the stone, the pressure is removed, and the photographic proof withdrawn carefully from the stone; *a negative image will then be seen in gum on the stone, with all the gradations of tone.* The stone is then dried, either spontaneously or by gently warming it. When well dried, I cover the whole surface of the stone with greasy ink, which may be applied with a roller or otherwise; the *greasy ink will penetrate all parts of the stone untouched by the gum*; the coating of ink is then removed by spirits of turpentine or otherwise, and all the gum washed from the surface of the stone, which is then rolled in with ordinary printing-ink, *and the positive image appears in black on the stone.*

It is then printed as any lithographic drawing, *but has the peculiarity of requiring no etching, the gum having, by the pressure applied, so far penetrated into the substance of the stone as to allow of a great number of proofs being taken off*—FIVE OR SIX THOUSAND!

All similar substances can be employed instead of gum arabic, which I prefer—such as gelatine, dextrine, and all mucilaginous substances.

Photozincography.—The same as for stone; but it is necessary to etch the plate.

Photographic Engraving on Steel, Copper, &c. &c.—The preliminary operations are the same as those I employ for the stone or zinc, excepting that a positive image on glass or paper must be used instead of a negative.

When the plate is withdrawn from the press, and the photographic proof detached from it, it must be well dried, as I have said for the stone; the plate is then covered with a thin coating of varnish, and, when dry, may be soaked in water to remove the gum, or immediately plunged in a weak acid solution and etched in the usual way employed for etching on steel or copper. Wherever the plate is protected from the varnish by the gum, it will be attacked by the acid, and an engraving is produced, which is then printed as an ordinary etching on metal.

I have explained to you, Sir, my new process, which I believe to be the best yet discovered. You will remark how very simple and few are the different operations to go through; and if carried out with proper care, can never fail.

Hoping you will excuse this rather long letter,—I am, Sir, yours truly,

W. Toovey.

◆

On the Curved-fronted Camera.

To the Editor of the Photographic Journal.

Sir,—When I penned my observations on the curved-fronted camera I fully anticipated the treatment I should experience for presuming to differ from that gentleman; but I had no idea that you would have to suffer for my sins. My back is broad enough to bear all Mr. Sutton has said or may say, and his hard words make about the same impression as would hailstones on the 'Warrior' target. There is, however, one part of Mr. Sutton's letter referring to Mr. Ross which I think it is incumbent on me to notice. *If* that gentleman *had* stated that he approved of the invention, I should, most certainly, have hesitated before I ventured to differ from him; but as he has not done so at any of the Photographic Meetings nor in any of the Journals, nor has he advertised the instrument for sale, I take it for granted that Mr. Sutton ordered a camera to be constructed on his principle, and that Mr. Ross has executed the order without guaranteeing its success.

Mr. Sutton calls me a Tom Noddy. This is, I conclude, something very dreadful; but although I have consulted Johnson, and racked my brain for a derivation of the word, I am unable to arrive at its meaning. It is true that I have not graduated at Cambridge; and at Rugby, where I received my modicum of education, Latin and Greek were the staple commodities: the derivation may therefore be Hebrew or high Dutch, for all I know to the contrary. You have probably heard Matthews's story of the woman who bore with great forbearance the epithets usually applied by the lower classes to each other, but became excessively irate when called a parallelogram. I conclude I ought to express my indignation for the same reason, viz. that I do not know what description of animal a Tom Noddy may happen to be. Now then for the curved-fronted camera. It may occasionally happen that one who has the modesty to acknowledge his ignorance may be correct, and "Sir Oracle" may find he has made a slight mistake. I have taken two views of the same object without shifting the camera—one with the camera front raised vertically, the other raised to the same height and the lens inclined at the angle indicated by Mr. Sutton. I focused both for the centre of the plate. The former is fairly sharp all over; the latter falls off wofully at both ends, but more especially at the top of the picture.

Mr. Sutton may probably quibble at my using the term "distortion," which is, I believe, applied by opticians to curvature of the lines only. I employed it in its more general sense, as will clearly be proved by the fact that Mr. Sutton stated he had used a triplet which does not give curved lines. An image of which any part is out of focus is clearly distorted. I enclose you prints from the negatives, in order that you may judge for yourself who is correct.

As regards my having stated my conviction that Mr. Sutton had not tried the plan he advocated, I have no reason for altering my opinion. That Mr. Sutton took the landscapes he exhibited at the Glasgow meeting with the curved-fronted camera, I do not for one moment doubt; but that such subjects constitute a *trial* I deny. Landscapes have generally *at least* one-third sky; and as the top is by far the worst part of the picture, the object for trial should be some lofty building, which would show the distortion (if any), and not sky or clouds, where it could not be indicated.

Baynham Jones.

[The photographs are left at our printers', that those who wish may inspect and satisfy themselves of the correctness of Mr. Baynham Jones's observations.—Ed.]

◆

Royal Horticultural Society,
South Kensington, W.
April 11, 1864.

Sir,—Will you kindly be the medium of communicating to the Photographic Society and to its individual Members, as well as any other photographers with whom you may be acquainted, the desire of this Society and of myself to have the benefit of their cooperation in making a Photographic Exhibition of portraits of Conifers in the Council Room here on the 21st of June?

On that day I give a Lecture on Conifers, which I will illustrate by drawings and photographs of these trees. The practice of taking and collecting photographs of trees in general, and more especially of Conifers, is now becoming common; and it is very desirable that it should be encouraged, and there is no better means of doing so than by showing how well they can be done.

There is, no doubt, a multitude of views in the portfolios of the Society in which some Conifer or other figures as an object. In the absence of actual portraits of trees, these incidental portraits would well supply their place.

If a sufficient number of specimens were sent in, the view might be continued for a week.

I shall be happy to receive any suggestions as to the best way of working out my idea.

I am, yours truly,
Andrew Murray.

Thurston Thomson, Esq.

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Amateur Photographic Association.

A Council-Meeting of the Amateur Photographic Association was held, April 14th, at 12 York Place, Portman Square, Lt.-Col. the Hon. Dudley Fitzgerald de Ros in the Chair. The minutes of the last Meeting having been read and confirmed, the following Members and Subscribers were proposed and elected:—The Hon. Ralph Abercrombie, the Hon. Miss Vesey, North Rees, Esq., H. Maxwell, Esq., W. Williamson, Esq., W. S. Hobson, Esq., Miss L. Moseley, M. F. Carter, Esq., Lt. H. W. J. Senior, R. H. Mitchell, Esq., Mrs. J. J. Bell, Major Durnford, C. Larking, Esq., Lady Staples, the Hon. Miss Beatrice Vesey, Rev. A. Johnson, Capt. C. C. Taylor, W. H. Humphreys, Esq., Lt. W. E. T. Bookey, E. Larking, Esq., — Clerk, Esq., C. Horsley, Esq., T. Spencer, Esq., C. Martyn, Esq., Rev. H. Holden, and Mrs. Leith.

The question of an Exhibition of the Society's Photographs was resumed, and, after a lengthened discussion, it was resolved to hold one at 12 York Place, as soon after the new negatives had been received as possible.

The Secretary then laid before the meeting a detailed account of moneys which had been paid according to Rules 10 and 13. The account included the names of nearly sixty members, with sums varying from a few shillings to several pounds.

The Secretary having stated, in reply to a question from Mr. Glaisher, that several of the Members and Subscribers had not yet received their pictures, it was resolved, on the motion of Mr. Glaisher, seconded by Mr. Gooch, that henceforth Members and Subscribers who shall not have selected the pictures due to them within two months of the close of each subscription year (which dates from June to June) shall have such pictures sent to them as shall be selected by the referees.

A. J. Melhuish, *Hon. Sec.*

◆

The Bromine Question and Mr. J. F. Goddard. Being two chapters connected with the early history of Photography.

By Jabez Hughes, Esq.

As the period for closing the Goddard Testimonial Fund has arrived, the occasion is appropriate, not only for thanking the many subscribers for their generosity in saving a photographic discoverer and a worthy man from indigence, but also for reviewing the claims made on his behalf, and the evidence on which they rest. The recent letter of Mr. Fox Talbot in the pages of a contemporary also necessitates the step.

The purpose of the original appeal was to show that Daguerreotype was indebted to Mr. Goddard; that he gave that art an impulse that has extended to subsequent processes; and, therefore, that his case was a fitting one for the benevolence of photographers. If, however, in making this appeal, the claims of earlier or contemporary discoverers were not mentioned, it should be borne in mind that it was not a chapter on early photography that was being written, but a statement of the case of Mr. Goddard; and nothing could be further from the minds of the gentlemen interested in him than intentionally to ignore the labours of others in the same field.

The year 1839 is a memorable one in photographic annals—a veritable *annus lucis*; for Fox Talbot and Daguerre then published their discoveries. These processes, though otherwise so singularly unlike, had one idea in common—the production of a latent image on a base of iodide of silver. Bromine formed no part of either process. Daguerreotype remained unimproved for several months after its publication in August 1839. In attempting portraiture, the difficulty experienced was the very long sitting required in brilliant sunshine. To obviate this, Woolcott's speculum camera was invented, and the sitting was thus materially abbreviated. In June 1840, Mr. Goddard, then lecturer on optics, natural philosophy, &c., was engaged by Messrs. Beard and Johnson (as explained in my paper of December 15th, 1863) to apply his scientific knowledge to the improvement of the Daguerreotype process. By a report in the 'Morning Chronicle,' Sept. 12, 1840, it appears that Mr. Beard had an establishment for producing portraits by the aid of Woolcott's camera, at the Medical Hall, near Furnival's Inn, Holborn, London; in this newspaper report, after an interesting description of this camera, and how the sunshine was tempered by passing through blue glass screens to mitigate the painfulness of the sitting, I find it further stated "that no expense is being spared to bring the process to perfection. For this purpose experiments on an extensive scale have been carried on under the superintendence of Mr. Goddard," &c. &c. These experiments bore fruit shortly after. A printed document is before me, dated December 8, 1840, entitled

Valuable Improvements in Daguerreotype Photography.

An Account of a new Means of preparing the Silver Plates for the Action of Light in Photographic Delineations of the Daguerreotype, discovered by J. F. GODDARD, Lecturer on Optics; late of the Polytechnic Institution and Royal Adelaide Gallery, London.

Having been engaged for some time past in investigating the different means of preparing the plates for the action of light, in photographic delineations of Daguerreotype, in hopes of being able to render them more sensitive, the result of my experiments has been the valuable discovery that when bromide of iodine is used instead of simple iodine, this very desirable object is attained in a most extraordinary degree. If iodine and bromine are placed together in equal proportions, they instantly combine and form a new compound, the bright scaly crystals of the former dissolving, and the new substance crystallizing in dark microscopic crystals of a beautiful arborescent appearance. These are exceedingly volatile, more so than the iodine alone, the vapour attacking the silver surface in a similar manner: and so delicately sensitive are the plates, when properly prepared, that the faintest light acts readily on them; even in the dull, cloudy days of November, with a London atmosphere, if not too foggy, and there is sufficient light to produce a picture, it will, with a few minutes' exposure, be clearly delineated. I have not had an opportunity of experimenting with bright solar light since I have made this discovery, but, from the experience I have had in the old process during the last summer, I have no doubt, with a clear summer sun, in London, the effects will be instantaneous. With the light of the ordinary gas-burners of the shops, a picture of a plaster bust may be obtained in three or four minutes. J. F. GODDARD.

In the 'Literary Gazette,' No. 1247, page 803 (published, London, December 12th, 1840), under the head of "Fine Arts," this same article appears as a communication from Mr. Goddard. The claims of this gentleman commence from this published statement; but he extended his researches and instituted a series of experiments on the haloid bodies—iodine, bromine, chlorine, and their combinations; and in March 1841 a sealed paper was deposited in the archives of the Royal Society, detailing some of these experiments. A copy of this paper follows, together with attesting correspondence.

St. Joseph's Retreat, Hammersmith,
March 2nd, 1864.

MY LORDS AND GENTLEMEN,—In the month of March 1841 you did me the honour, at the request of Mr. Kiernan, of placing in the Royal Society a sealed paper containing notes of experiments made in the application of the Daguerreotype process to the taking likenesses from life.

I had previously published my discovery of the extraordinary sensitive property of the vapour of bromine in combination with iodine (see 'Literary Gazette,' December 12th, 1840). I was desirous to furnish a process that would be effective, simple, and practicable for artists more particularly, as in their hands it would be a most valuable auxiliary. For this purpose I commenced a series of experiments, the result of which was the adoption of the A and B mixtures, as detailed in the accompanying paper *. The time that has elapsed having brought so many scientific labourers into the field, and the Daguerreotype process itself having been superseded by the process on paper of which the Hon. Fox Talbot is the inventor, I have now most respectfully to beg the favour that the sealed packet may be opened and read with the accompanying paper * on the process used at the opening of the first professional photographic establishment at the Polytechnic Institution (a copy of which paper was furnished by Mr. Beard for the use of his licensees).

It may be interesting and valuable in photography to know, that, by the use of my A and B mixtures, the portraits or pictures were so eaten or bitten into the silver surface, that after being washed with the hyposulphite of soda solution, and the mercury on the plate wiped off, they remained so engraved as to be printed by the ordinary copper-plate printing process.—I have the honour to be, my Lords and Gentlemen, your obedient servant, J. F. GODDARD.

To the President and Council, Royal Society.

The Royal Society, Burlington House,
March 18th, 1864.

DEAR SIR,—I have to acknowledge the receipt of your letter of the 2nd inst., with enclosures, desiring that the sealed packet placed by you in the custody of the Royal Society, in 1841, may be opened, and the contained writing examined.

Before proceeding to comply with your request, the officers of the Society desire to be informed what further steps you wish to be taken, when the document enclosed in the envelope has been inspected. It occurs to me that your purpose would probably be answered if we transmit to you a copy certified to be faithfully transcribed from the paper deposited by you in 1841.

I may explain that some years ago it was resolved to discontinue the practice of receiving deposits of sealed packets, but as yours was deposited anteriorly to that resolution, you are of course entitled to the advantage of any evidence that such deposit was intended to supply.—I remain, dear Sir, your obedient servant,

W. SHARPEY, M.D., Sec. Royal Society.

Mr. J. F. Goddard.

March 23rd, 1864.

DEAR SIR,—I beg to acknowledge the receipt of your kind communication of the 18th inst., and in reply to the request of the officers of the Royal Society as to the further steps I desire, I beg respectfully to say that I shall feel greatly obliged by being furnished with a copy certified to be faithfully transcribed from the paper deposited by me with the Royal Society in March 1841, and for which I shall feel most grateful.—I remain, dear Sir, your obedient servant, J. F. Goddard.

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* The paper alluded to, descriptive of the A and B mixtures, is a lengthy document, and chiefly consists of the mode of preparing and using certain preparations of iodine, chlorine, and iodous acid that Mr. Goddard introduced in Daguerreotype. Its value appears to have passed away with the process to which it refers, and its present interest is only as descriptive of the process used at the first English photographic establishment.

Dr. Sharpey, Sec. Royal Society.

The Royal Society, Burlington House,
March 29th, 1864.

On this day a packet, inscribed "Notes, &c., of Discoveries in Daguerreotype, by John Frederick Goddard, March 4th, 1841," and sealed with the seal of the Royal Society, and with the seal of Lord Northampton, the late president, was opened by me in the presence of Mr. W. White, assistant secretary of the Royal Society, by the author's request. It contained a paper, of which the following is a true copy:—

20 London Street, Fitzroy Square,
March 2nd, 1841.

Notes (from the Daily Journal of Mr. J. F. Goddard) on Experiments in Photography.

1841. Jan. 17th. Made a small quantity of iodous acid.

1841. Jan. 18th. Tried its action on silver plates for taking miniatures by the Daguerreotype, and found it to answer, the sensitiveness of the plate being greatly increased, and the pictures more marked and stronger than any hitherto produced.

1841. Jan. 24th. Made more Iodous acid.

1841. Jan. 28th. Tried the iodous acid, combined with a solution of iodic acid and the bromide of iodine, in taking the portrait of Mr. Beard. The picture strong, but very blue [see specimen]. Afterward increased the proportions of pure iodine, and took a portrait of Mr. Carpmael; afterwards another of Mr. S. Carpmael. Much improved, pictures whiter [see specimens].

1841. Feb. 12th. Again tried the iodous acid, and solution of iodic acid with pure iodine, and a few grains of bromide of iodine, and obtained a portrait of Mr. Johnson, sen., which is very far the most beautiful and perfect of any hitherto produced, although taken in heavy rain, in two minutes and a few seconds. The character strong and marked, not requiring to be held in a particular light to catch the most beautiful effects, being clearly and distinctly seen in any position, even by artificial light.

Afterwards took one of myself [see specimens].

1841. Feb. 16th. Took a beautiful portrait of my father (Mr. Goddard, of Chatham), by the same process as above; time, very cloudy and dark, 2 minutes 10 seconds.

1841. Feb. 18th. Attending the meeting of the Royal Society at Somerset House, and showed the portraits of Mr. Johnson, taken on the 12th, and also of my father, taken on the 16th, to the President, the Marquis of Northampton, Sir John Lubbock, Dr. Roget, Prof. Wheatstone, Mr. Kiernan, R. H. Solly, Esq.

(Signed) Jno. F. Goddard.

Certified by W. Sharpey, M.D.,
Secretary of the Royal Society.

March 29th, 1864.

[To be continued.]

REPORT OF JURORS.

[Continued from vol. viii. p. 448.]

Austria.

671. **Dietzler, C.** (Medal).

679. **Voigtländer and Son** (Medal).—These two names may with great propriety be associated, both having received Medals for the excellence of their lenses, and both basing the construction of them on the calculations of Professor Petzvál. The lenses of Voigtländer are characterized in a remarkable degree by intensity and perfect definition on a mathematical plane. The lenses of these makers combine qualities which render them eminently valuable to the photographer.

—— **Ponti, Charles** (Medal).—A Medal was awarded for a novel instrument styled the "alethoscope," invented by this exhibitor, by which very remarkable effects of relief and illumination are obtained. This instrument was only introduced into the Exhibition a few days before the Jurors closed their labours: they are enabled, however, to state that it will doubtless afford a new source of interest in the application of photographic pictures, and with a new object to amateurs in the art.

128. **Moll, A.** (H. M.), displays a remarkably fine series of photographic chemicals, showing that much care has been used in their preparation, and appearing to the Jury well worthy of commendation.

France.

1458. **Bertaud** (Medal).

1488. **Derogy** (Medal).—To both of these exhibitors in the French department Medals were awarded. The first-named received the award for an orthoscopic lens of very large diameter and excellent quality.

The lenses of Derogy were fully tested by the Jury, and proved highly satisfactory. An ingenious arrangement for lengthening and shortening the focus of the objective by the addition of a central lens was found to answer admirably well for the purpose for which it was intended.

1459. **Bertsch, A.** (Medal).—A Medal was awarded for a series of novelties in photographic apparatus. These consist of several automatic cameras with portable laboratory, to facilitate the working of wet collodion out of doors without the necessity of a dark tent; also for a very excellent enlarging apparatus, which he styles a "*mégascope héliographe,*" the utility of which is illustrated by a variety of fine pictures enlarged from very small negatives. The collodion of this manufacturer is very good.

1457. **Duboscq, L. J.** (Medal).—The apparatus for which a Medal was awarded in this instance consisted of the appliances for using the electric light in photographic purposes, and as a source of illumination for the enlargement of pictures. It is stated that the specimens by Numa-Blanc (1494) and Villette (1456) were produced by means of this apparatus.

1451. Titus-Albites (H. M.).—A manipulating laboratory camera, by which all the collodion process may be worked without any dark room or tent. The principle is similar to that of the original Archer's camera, but modified as regards the arrangements, which are very ingenious and deserving much commendation.

1476. Briois, C. A. (H. M.). 1486. Garin and Co. (H. M.). 1475. Puech, L. (H. M). 1493. Mathieu-Plessy (H. M.).

Honourable Mention was granted to these exhibitors for general excellence of the various photographic materials which they exhibited, consisting of apparatus, photographic paper, and chemicals. In reference to the chemicals, they deserve especial attention from the purity of the samples, as well as for the moderate price at which they are vended.

1490. Hermagis (H. M.) contributes a good assortment of lenses and photographic apparatus. His lenses have for a long time justly held a high reputation in France.

1482. Koch (H. M.).—This exhibitor is held in high estimation by his own countrymen, and the award is for general excellence of his apparatus.

1474. Marion (H. M.) contributes a variety of articles appertaining to the stationery of photography, consisting of albuminized paper, cases for preserving sensitive paper, albums, &c. These were all considered of great excellence.

1489. Millet, A. (H. M.).—A variety of photographic lenses and fine pictures obtained by their aid are considered by the Jury well worthy of attention.

1473. Rolloy (H. M.) exhibits a variety of good photographic chemicals and papers, also a varnish which on trial appeared to the Jury to possess many of the excellent qualities of the Soehnee varnish.

Hamburg.

36. Krüss, A. (Medal).

Prussia.

1420. Busch, E. (Medal).—Both contribute lenses for photographic purposes, which on trial were found to combine many excellent qualities in an eminent degree, and some were moreover distinguished by great cheapness.

1433. Scheringe (Medal).—The photographic chemicals of this exhibitor are well worthy of attention: they appear to be prepared with great care, chiefly for the supply of the retail houses. When purchased in any quantity, these productions are very cheap.

1419. Beyrich, F. (H. M.). 1427. Kunzmann (H. M.).

They exhibit many very fine samples of photographic papers, albuminized and plain. Results of a trial of several samples were very satisfactory, the proofs obtained being brilliant and perfect.

[To be continued.]

"Bringing Home the May."

The distribution of Mr. Robinson's picture, "Bringing Home the May," will take place very shortly: each Member, who has paid his subscription for the current year, will be written to when it is ready.

Usefulness of Photography in the Law Courts.—In the discharge of their duty it should be added they have been vastly assisted by the application of the art of photography, which so happily unites the useful with the beautiful. Photographs have been executed of all the principal documents in the case—the duplicates of the will, of all the three disputed codicils, and the "epitome" or abstract of the will, and even of the envelope with the endorsement—"This is my rigt will;" nay, even of the memorable loft or lumber-room, and the window in it which (as the learned and witty serjeant who leads for the defendants said) would probably be "famous in local history," the window beneath which the third codicil was said to have been discovered in the "hole in the wall." And thus every one of the twelve jurymen was enabled, having before him the photographs of the principal documents, to follow the observations of counsel or the evidence of witnesses as to handwriting. This novel application of the beautiful invention of photography was of particular use in this case, in which there were as many as six documents to compare, and but for this valuable assistance it is obvious that it would have been difficult for the jury to make an effective comparison of them, and impossible to do so simultaneously.

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All Communications for the Journal should be addressed to the Editor, at the Publishers', Messrs. Taylor and Francis, Red Lion Court, Fleet Street.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 146. JUNE 15, 1864.

"The Exhibition."

It was intended that the present Number should contain a Report from the Members forming the Committee for its management, together with a List of the Awards made by them in the several departments for which it has been resolved that Medals should be given.

We regret the inability to carry out this intention in consequence of the serious differences of opinion which prevail in the adjudication of the Prizes.

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Notice to Members.

The Exhibition is now open to Members and their friends, personally introduced by them, at the Gallery of Female Artists, 48 Pall Mall. Open from 10 until 7, daily. Will close the first week in August.

PHOTOGRAPHIC SOCIETY OF LONDON.

Ordinary General Meeting.

King's College, London.

Tuesday, June 7, 1864.

James Glaisher, Esq., F.R.S., F.R.A.S., in the Chair.

The Minutes of the previous Meeting were read and confirmed.

Mrs. **Julia Margaret Cameron** and the Rev. T. M. **Raven** were elected Members of the Society.

The **Chairman** invited attention to three portraits taken by Mr. Brothers, of Manchester, by the aid of the magnesium light. The first was described at the back as that of Professor Faraday. He had known the Professor very many years, but must confess he could discover no likeness whatever to him in this picture. The second was described as Professor Roscoe; and, in point of likeness, it seemed to him to be just as faulty. The third was Sir H. Holland. He would be glad to learn if any of the Members could discover any likeness in the pictures. It seemed to him very singular that they were so unlike the gentlemen whom they were intended to represent.

The **Chairman** read the following letter, received in answer to an invitation forwarded to the Prince and Princess of Wales, inviting them to visit the Exhibition of the Society before it was opened to the public:—

Marlborough House, Pall Mall. S.W.
27 May, 1864.

Sir,—I am desired to say, in reply to your letter of the 21st inst., addressed to General Knollys, that the Prince and Princess of Wales very much fear that their engagements will not admit of their visiting the Exhibition of the Photographic Society tomorrow morning.

Their Royal Highnesses desire to thank the President and Council of the Society for their kindness in communicating with them on the subject.

I have the honour to be,
Sir,
Your most obedient Servant,
Herbert Fisher.

He might add that every effort has been made to secure the prestige of a visit from the Prince and Princess; but other engagements, it appeared, rendered the visit impossible. He might further now take occasion to remind Members that the Exhibition was open in Pall Mall, and that each Member would have the privilege of admission with a friend, on signing their name at the entrance.

The **Chairman** called attention to seventeen photographs taken in South America by M.

Rousseau, of Valparaiso, including instantaneous pictures of horses, &c.

The Secretary read the following letter from Mr. Ross:—

London, June 7, 1864.

Sir,—As I see in the Photographic Journal that Mr. Baynham Jones expresses strong doubts whether Mr. Sutton's curved-fronted camera possesses the qualities claimed for it by the inventor, I have the pleasure (with the view of setting that question at rest) to send you, for the purpose of thorough examination by the Members of the Society,

1°. A print from a negative taken with my No. 1 Actinic Triplet, 8 inches equivalent focus, $\frac{3}{10}$ in. stop. The subject is part of the front elevation of King's College. The camera was perfectly level, and the lens much elevated.

2°. The identical camera which Mr. Sutton employed in taking his negatives, and with which the negative above alluded to was taken.

For the information of the Members generally, as well as for that of Mr. Baynham Jones, I have sent the camera itself, in order that, after careful examination, its merits or demerits may be made manifest.

Yours respectfully,
Thomas Ross.

To the President of the Photographic Society.

The Chairman said the Society was not in a position to discuss the merits of any camera. The Journal would be doubtless open to a reply to any statement made in it, and the Society was always glad to receive suggestions and information; but Mr. Ross must be content to have the picture examined, without entering into any discussion of the matter. The picture and camera might be placed on the table, and Members might form their own conclusions.

Mr. Underwood thought it was an advantage for Members to have an opportunity of seeing the camera.

The Chairman agreed with him, and they were, of course, obliged to Mr. Ross; but the Society must not attempt, as a Society, to express an opinion on the productions of individuals. They must in all things hold an even balance; and the subject had therefore better not be discussed.

Mr. F. W. Hart exhibited a contrivance for burning the magnesium wire, by which the wire could be steadily uncoiled as it was consumed, the wire passing into the flame of a spirit-lamp to prevent intermission of the light as much as possible. He explained that the one or two intermissions which occurred whilst illustrating the action of the lamp arose from the presence of small portions of calcium in the wire, which the manufacturers had not yet been able to entirely eliminate. He mentioned a circumstance in connexion with it which might be useful to photographers in obtaining portraits of young children. In testing his lamp at home, he noticed that a baby looked steadily at the light for 40 or 50 seconds without moving—fully long enough for a portrait to have been secured.

Mr. Underwood asked what was the difference between this and the oxyhydrogen light.

Mr. Hart stated that this was more actinic, and that magnesium ignited at a much lower temperature than calcium.

The Chairman said he was sure the Meeting would have much pleasure in thanking Mr. Hart for affording them an opportunity of witnessing the great brilliancy and actinic character of this light. If the wire itself or the lamp were not quite perfect at present, they had seen sufficient to be assured of the great importance they both would possess in aiding further developments of their beautiful art.

Mr. Hart said there had been so much difficulty in obtaining the wire, that he had not been able to test the lamp sufficiently; but he could now easily make the modifications necessary to secure the most steady and perfect action.

The Chairman then called upon Mr. Smyth to proceed with his solar-camera experiment with the magnesium light, and called attention to some solar-camera enlargements by Mr. Smyth and Mr. Percy Bachoffner. Whilst the apparatus was arranged, the Chairman asked Mr. Shadbolt to exhibit some specimens of transferred negatives.

Mr. Shadbolt said the specimens he produced were removed from the glass by a process analogous to Mr. Swan's, which their attention had been called to at a recent Meeting, by Mr. Wenderoth, of Philadelphia, who had for some time practised the method without any knowledge of Mr. Swan's proceedings. Mr. Wenderoth, he thought, had so perfected the process as to make it quite safe, without any risk of destroying the film, which in Mr. Swan's process, it seemed, was possible. The full details had been published in the last number of the 'British Journal.' He commenced by rubbing a roughly cleaned plate of glass with a saturated solution of white wax in sulphuric ether; this, when rubbed off with a clean cloth, left a scarcely perceptible layer of wax on the glass, which was sufficient, however, to ensure the film coming perfectly away in the process of transferring. The negative was then taken in the usual way. In transferring, Mr. Wenderoth used a tissue made somewhat in the same manner as Mr. Swan's, with gelatine and glycerine, but without bichromate or colouring-matter. This tissue was placed upon the moistened negative, and pressed down. When dry, the negative might be removed from the glass, and would consist of a film of flexible gelatine between two films of collodion, effectually protecting the film of gelatine from moisture. The examples he now exhibited had crossed the Atlantic, and suffered some rough usage (one of them had been folded twice) without injury. The only question which could cause any doubt was as to the permanency of negatives so transferred. On that subject he was able, in the somewhat unphotographic vessel he held in his hand, to offer some evidence. He asked attention to its very dusty state, as that formed an important element of the case, as it showed that it had not been used for a very long time, and had acquired the dust of years. It contained a piece of a mixture of gelatine and glycerine prepared by himself fourteen years ago, for mounting microscopic objects. This was still perfect and quite flexible, not having decomposed, or exhibited any fungoid growth in any degree. It was possible he might have used creosote water in dissolving the gelatine, but he was uncertain. The permanency of this material afforded a fair guarantee of the permanency of the transferred negatives, and he thought photographers might avail themselves of the advantage of thus stowing away their negatives with great confidence.

The gelatine and glycerine was then passed round. It consisted of a transparent cake of flexible material, quite free from hardness, mouldiness, or decomposition.

The **Chairman** remarked that the process of transferring was a very elegant and very useful one; and Members would, he felt sure, have much pleasure in thanking Mr. Shadbolt.

Mr. **Shadbolt** said he might mention the fact that, where it was necessary to produce one print from several negatives, these transferred films could be easily so joined as to do the work at one operation, instead of several as was now necessary, and thus secure a great advantage.

Mr. **Sydney Smyth** then proceeded to his experiment with the solar camera, and produced a very good picture with the magnesium light, which excited much interest.

The **Chairman** said the experiment was, under the circumstances, a most successful one, and very important. He proposed a vote of thanks to Mr. Smyth, and asked if any gentleman had any observations to make on the experiment.

Mr. **Wharton Simpson** said he had just elicited from Mr. Smyth that the amount of wire burnt to obtain sufficient light for the picture was about twelve grains, measuring in length about twelve inches. This statement of the amount required to produce sufficient light would probably interest Members.

The **Chairman** then said that this was the last Meeting of the present Session, and many of the Members would doubtless visit nooks and corners not before depicted by the camera, and bring back mementoes of their visit. He hoped they would be successful, and he had a motive for it; for he hoped they would allow him and the rest of the Members to see their results. He hoped, when they met again in November, to see many charming photographs, the trophies of their summer campaign. He would again remind Members that the Exhibition was open at No. 48 Pall Mall; and he hoped that it would have numerous visitors, not only Members, but those of their friends who by their payments would add to the receipts of the Exhibition.

The **Secretary** exhibited seventeen beautiful views taken in Chili, South America, by Mr. C. L. Rowsell. These pictures were intended for the Exhibition in Pall Mall, but were forwarded to King's College, where they had been retained until the present evening.

The Meeting was then adjourned.

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The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors.

No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith.

The same proviso extends to communications to the Editor.

Transferring Negatives.

The following are the details of the method of transferring negatives described by Mr. Swan in the *Photographic News*:—

The negative is taken in the usual manner, and after the collodion film is dry, I warm the plate to 80° or 100° Fahr.; I then place it in a horizontal position, collodion face up, and pour on the following solution at about the same temperature as the plate:—

Gelatine	1 ounce.
Water............	4 ounces.
Glycerine	½ drachm.

The quantity applied may be varied according to circumstances, but, generally, I find about 1 ounce of the gelatine solution enough for the 8½ by 6½-inch plate.

The proper quantity having been poured on the centre of the plate, I incline it from side to side, so as to cause the liquid to flow over the entire surface; and I assist the flowing by a glass rod, using it as in coating sensitive paper, and being careful to avoid the formation of air-bubbles.

When the entire surface of the negative is coated, the plate, if placed perfectly horizontal, may be allowed to rest until the gelatine-solution "sets." If, however, the plate is not strictly level, it is admissible to keep turning it slowly during the few minutes that elapse between the coating and setting.

After the gelatine is set, the plate may be placed in a box, or drawer, or closet, out of the way of dust, and where the gelatine coating will become dry, say, in the course of 24 hours. After this, I varnish the gelatine surface with lac varnish (vernis Sœhnee, for example), the coating of varnish being applied in the usual manner. When the varnish is dry, I make an incision, with the point of a knife, round the plate, cutting through the coating to the glass, at about a quarter of an inch from the margin. I then raise one corner of the sheet and carefully lift it all off.

There are a few precautions to be observed to prevent miscarriage:—

1st. The collodion with which the negative is made should have a good strong body. It is not quite safe to attempt the transfer of a negative made with collodion which produces a weak and porous film.

2nd. The gelatine should be clarified with albumen, and strained through flannel wrung out of warm water just before using; and the straining should be so managed as to prevent the formation of air-bubbles.

3rd. If heat be used after the application of the varnish, it should be very moderate, and not continued so long as to produce a brittle dryness of the gelatine.

The glycerine is introduced to guard against this; othewise it is not necessary. I have not quite determined the best proportion of glycerine, but I know that the quantity named in the formula here given answers the purpose.

The collodion surface of the negative is, of course, the proper one for placing in contact with the printing-surface. The surface of collodion is surprisingly hard, and, I think, will bear a good deal of wear without abrasion in the act of printing from it; but in the case of any negative from which a very extensive series of impressions might be required, it would, I think, be well to varnish both surfaces; this might be done very easily by the immersion of the negative in the varnish.

If the transferred negative were used for silver printing, the gelatine side of the negative would have to be placed in contact with the sensitive paper, in order to avoid the reversal of the image; and this is attended with the loss of detail, more or less, according to the thickness of the gelatine-film, which, in this case, intervenes between the sensitive paper and the negative image residing in the film of collodion.

In proposing the transfer of negatives, I had more particularly in view their application to my process of carbon printing, where the collodion surface of the negative would come into contact with the sensitive tissue, and so the most perfect detail would be secured.

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On a new Method of Photography with Dry Collodion. Described and recommended by P. J. Kaiser.

Some time since, when wishing to take photographs of astronomical instruments by the dry-collodion process, I found the methods hitherto published, and accurately described, only gave me very indifferent results. I was prevented by other engagements from inquiring into the cause of these failures. Experience has shown me, however, that most of the substances hitherto employed will only produce good results in certain conditions. For example, the results obtained by Russell's process differed greatly according to the tannin prepared by different manufacturers. The well-known process in which an infusion of linseed is recommended produces various results, according to the age of the seed; and it is naturally very difficult to determine what should be the age of the linseed to ensure the best results. I resolved to try a method of preparation which must, I thought, prove successful, assuming that the iodide of silver exposed to the action of light is decomposed into iodine and silver. I succeeded beyond my expectations; for the iodized plates, prepared by my process, are most frequently quite as sensitive as the damp plates. These plates may be kept upwards of a month without losing any of their good quality, and the development may be delayed the same length of time after exposure to the light. By my process the collodion and the silver ba must of necessity produce good negatives b the wet method. For this reason, in my Dutc article on the subject, I gave a detailed de scription of my plan for preparing the gun cotton, collodion, nitrate of silver, the silve bath, &c. I believe, however, that any collodio and silver bath that fulfils the following co ditions will produce dry plates of good qualit —viz., that the collodion contain only a iodide, and that a neutral iron bath be use for the development. These conditions being fulfilled, a plate when taken out of the silver bath must be washed with filtered rain-water until the fluid flows uniformly. The plate should then be washed in the following solution:—

Absolute alcohol	3 oz.
Acetic ether	1 drachm.
Camphor	10 grains.

It is desirable that nearly all the water adhering to the plate be removed with a single wash of the alcoholic solution. To attain this object the fluid must be poured gently upon one corner; the alcohol will drive the water before it, without mixing with it, so that it is very easy to expel nearly all the water at the opposite corner of the plate. A second application of the alcoholic solution will be generally found sufficient to make the liquid flow uniformly and evenly. The plate must now be placed on blotting-paper to dry, kept carefully out of the dust, and, above all, out of any draught of air, as the least draught will make a stain where it falls by accelerating the evaporation of the volatile fluid. The plate will be dry and ready for use in half an hour.

The development is effected by a solution of

Pyrogallic acid	15 grains.
Citric acid	30 „
Distilled water	2 oz.

a few drops of a weak solution of nitrate of silver (5 per cent.) being added immediately before use; or by the iron bath recommended by Valentine Blanchard for strengthening the negatives. This bath is prepared by dissolving 1 gramme of sulphate of iron and 2 grammes of citric acid in 100 cubic centimetres of distilled water, with the addition of some few drops of the aqueous solution of nitrate of silver.—*Tijdschrift voor Photographie, edited by M. L. P. van der Buk, Captain in the Army of the Netherlands.*

Dish for Sensitizing Paper.

To the Editor of the Photographic Journal.

The Vicarage, Tilshead.

SIR,—In the 'Year-book of Photography' (1864) there is a paper by Mr. Blanchard upon photographic printing, in which he gives a method of constructing a cheap dish for sensitizing paper. I need not quote this gentleman's words at length; it will be sufficient to state, as briefly as possible, what the plan is. Four pieces of dry and well-seasoned board, of the requisite thickness and length, are provided. In each of these plough-grooves are cut the whole length of one side, sufficiently wide to take a piece of plate glass; this being inserted and the sides screwed together, the dish is finished, except that the wood must be well covered with shellac varnish. Five years ago I made a dish in the way described. I used no putty, as Mr. B. recommends, in the grooves, but varnish only. The wood was walnut. I was much pleased with the article, not only because it had a perfectly flat bottom, and thus secured an even action upon the surface of the paper, but because the cost was very trifling. I soon found, however, that I could not return the nitrate of silver to its bottle, even when I used a funnel, without considerable waste. This discovery greatly altered my opinion as to the real value and economy of the contrivance, and the result was the banishment of the dish to the society of other useless apparatus, where it remained until the commencement of the present year. On again taking up my dish, I thought it would be possible to make some kind of spout through which to run off the fluid. This idea I did not carry out; for I saw several difficulties in the way, which I thought I could not surmount. I then got a bottle with a good lip, and cut off the neck, which was easily done with a hot iron, and after making a hole at one corner, as close to the glass as possible, I cemented the bottle-neck into it with lac. Nothing now remained to complete the work but to grind-in a stopper. This I did; and now my wooden box, with a glass bottom, answers every purpose as well as the most expensive dish; indeed, I use one made in the same way for toning.

J. H. JOHNSON.

To the Editor of the Photographic Journal.

14 St. Ann's Square,
Manchester, June 11, 1864.

SIR,—I am surprised that such remarks as were made by the Chairman at the last Meeting of the London Photographic Society, respecting my portraits taken by the magnesium light, should be allowed to appear in your report. They are not only unjust, but are wanting in common courtesy. The portrait is not only "described as" but *is* an excellent portrait of Professor Faraday; and the same remark applies to the two others named. You have, in a leading article, described these portraits as being equal to what could be done in daylight. This may be true to some extent; but I have never claimed any such excellence for them, and it is extremely unfair to criticise them as if they were taken in daylight and with all the appliances of the operating-room. It must be borne in mind that the portraits of Professor Faraday and Sir H. Holland were done at the Royal Institution, London, and the one first named, before the audience; and if "great applause" means anything from a very large audience, it shows that the portraits were not only good, but recognized and appreciated. As to the one of Professor Roscoe, it is shown as *the first portrait* ever taken by the new *artificial light,* and for no other reason. The next time Mr. Glaisher sees Professor Faraday he will notice why this portrait is not like others he has seen, the hair and beard being worn differently. I must apologize for troubling you with this letter; but I cannot conceal the annoyance caused by Mr. Glaisher's remarks, having incurred considerable expense and devoted much time in my experiments for the advancement of this new branch of photography.

A. Brothers.

[A Report of the Meeting having already appeared, Mr. Brothers has requested the insertion of the above, in explanation of the pictures kindly sent by him to the Secretary.—Ed.]

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A Delicate Operation in Photography.

To the Editor of the Photographic Journal.

New York, May 1st, 1864.

Sir,—You will probably feel considerably surprised at hearing from a stranger (a non-professional one, at that) on such a subject as I am about to introduce; but the fact is, I *hope* that *delicate* operations in photography are better understood in Europe than on this side of the Atlantic. Not that operators in London are *naturally* more skilful than here, but rather because you devote far more time and perseverance to experiments of various kinds, and without which no art can be brought to perfection. What I wish to know is this:—I have an ambrotype of an only deceased child, a boy six years old, that is what is termed an "overdone" picture. There is considerable "detail" in it, but it is *too faintly marked as a positive.* I have had it copied by many different operators, and various processes; but, of course, as the lines are very faint both by *transmitted* and *reflected* light, the copies from the camera are inferior to the original. I have also had it copied by the best miniature-painter America ever produced; but although his work is pronounced a master-piece of art, it is not so decided as I could wish. He has reproduced *all* contained in the original; consequently what I *require now* is, *some process to improve the original.* In reading photographic works, I have learned that weak negatives can be strengthened, intensified, &c.; then what is the reason this ambrotype cannot be further developed, so as to give more of the details, and consequently more of the *form* and *character* of the departed child? Perhaps the trouble lies in the ambrotype's being *varnished*? Have you no process that will remove the varnish without injury to the collodion? Is there nothing that would act as a developer through the varnish when softened, without the risk of taking it entirely off? I would be willing to risk the destruction of the original, if there were any reasonable probability of success; but would like it tried by experienced hands, and by the best process at present known to the profession. An experienced gentleman here says it certainly *might* have been made into a very fair negative before the varnish was applied, but that would be a very hazardous experiment now. However, as experiments that appear difficult or even insurmountable to some are very simple to others, I thought I would write and ask you to lay the question before the Members of your Photographic Society, for their opinion. If considered plausible, I would send the picture over by European express, except you can give some simple and effectual plan that could as *safely* be carried out here. You will naturally think I am over-fastidious, perhaps foolish; but the truth is, an only child is a heavy loss, and if I have any portrait of him, I wish it to be as near as possible up to life. Besides, for the sake of humanity at large, such experiments ought to be tried, and the results given to the world. I will remark, by the way, that ambrotypes are a curse to the public, as people do not find out their worthlessness until too late to remedy the evil. In fact, I see nothing here, in spite of all the recent improvements, that can begin to compare for strength, softness, and perfection of delineation with the good, old-fashioned Daguerreotype. When will the public learn this?

John Medhurst.

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On the Behaviour of Chloride, Bromide, and Iodide of Silver in the Light, and on the Theory of Photography. By Hermann Vogel.

Translated from Poggendorff's 'Annalen,' 1863, p. 497.

(Continued from vol. viii. p. 378.)

II. *What influence is exerted by foreign substances on the changes undergone by chloride, bromide, and iodide of silver when exposed to the light?*

I come now to the solution of the second of the questions proposed above. That the presence of foreign matters exercises sometimes a favourable, sometimes an antagonistic influence upon the chemical action of light has already been repeatedly noticed by previous investigators. Thus Scheele asserts the preventive influence of nitric acid, which, however, Wetzlar (*loc. cit.*) denies; the latter, however, declares that solution of sulphate of iron prevents, or at least greatly hinders, the blackening of chloride of silver.

Seebeck asserts (Pogg. Annal. ix. p. 172) that chloride of silver is decomposed only in the presence of moisture, but not *in vacuo* or beneath sulphuric acid and alcohol.

Perchloride of mercury is capable of entirely preventing the blackening of chloride of silver, according to H. Rose.

With regard to iodide and bromide of silver there are but few special investigations. People have been contented with ascertaining the influences exerted by acids, silver salts, and other bodies in photographic operations, without troubling themselves particularly about the chemical and physical changes taking place in them.

Thus the favourable influence of nitrate of silver, and the unfavourable action of acids, upon the photographic changes undergone by chloride, bromide, and iodide of silver have long been known. But few experiments with *pure* bromide and iodide of silver are extant; and therefore we cannot wonder if the opinions enunciated with regard to the influences just mentioned are in the highest degree obscure. During the description of my experiments, I will more closely examine these views.

1. *Influence of water.*

Several tubes with [wet] chloride, bromide, and iodide of silver were exposed simultaneously with the same salts in the dry state. The samples under water behaved in exactly the same manner as the dry ones. After long exposure to light, the water above the silver salts was tested; that from the chloride gave a distinct reaction of H Cl. This fact has already been observed by Scheele, Wetzlar, Hunt, and many others. I also found that the supernatant water of the bromide gave a reaction of H Br. The water from the iodide *did not give a trace* of a reaction, either in the case of $Ag\,I^{\alpha}$ or $Ag\,I^{\beta}$.

In order to ascertain whether *perfectly* dry chloride of silver behaves in the light otherwise than the air-dried salt, two test-tubes with chloride of silver were dried in the air-bath in the dark, at 248° F., closed immediately with corks and sealing-wax, and then exposed simultaneously with two moist samples. Immediately after drying, the chloride appeared somewhat greyish white; on exposure, it acquired at first a greyish-blue colour, while the moist portion was more violet; but the greyish-blue tint of the former afterwards also passed to violet. No particular difference of intensity could be detected.

2. *Influence of acids.*

Whilst water has no perceptible action upon the chemical change undergone by chloride, bromide, and iodide of silver in the light, acids exert a decidedly retarding influence upon it. This is manifested most strongly in the case of the iodide, and most slightly in that of the chloride.

a. *Experiments with chloride of silver.*

In respect of chloride of silver many investigations have already been made upon the present subject (*vide suprà*). My experiments were made by placing chloride of silver in tubes in the dark, and adding various acids; the tubes were then exposed to the light simultaneously with chloride of silver in the dry state and moistened with water, and after a certain time the coloration of the different samples was compared. In this way it appeared that the change of colour is not perceptibly hindered by the presence of acetic acid and of dilute sulphuric acid (1 part water to 5 parts acid), but that nitric acid of spec. grav. 1·2 somewhat retards the coloration by light.

It is otherwise, however, with concentrated English sulphuric acid and yellow fuming nitric acid (of spec. grav. 1·4). I put the acids into shallow glass vessels, threw pulverulent chloride of silver into them, and laid slightly moistened chloride *under* the vessels. The portions of chloride of silver placed *beneath* the glass vessels with acid became darkened much more rapidly than those lying *in* the acid; this was the case also when the chloride of silver placed under the vessels was dry,—a proof that here the conditions of moisture have no influence.

The retardation produced by nitric acid of spec. grav. 1·4 (yellow and fuming) upon the change of chloride of silver is due, *in part*, to an absorption of the chemical rays; for the chloride placed beneath the vessel is coloured more slowly than chloride exposed freely beside it.

Fuming sulphuric acid *entirely* prevents the coloration by light. Even after exposure for weeks, the chloride of silver beneath sulphuric acid remained perfectly white, whilst that placed under the vessel had acquired a violet colour. The latter effect, however, was produced rather more slowly than with chloride of silver lying open or covered with a glass,—a proof that sulphuric acid likewise partially absorbs the chemical rays.

This prevention of the decomposition of chloride of silver by fuming sulphuric acid is certainly due to the fact that the chloride forms with anhydrous sulphuric acid a compound which is insensible to the action of light*; for I remarked that a portion of the chloride was dissolved in the fuming sulphuric acid. By exposure to the air and dilution this solution became turbid, and white chloride of silver was deposited, which soon acquired a violet-colour beneath the dilute acid.

Protochloride of mercury exerts a similar influence: as has already been discovered by H. Rose, this salt completely prevents the coloration of chloride of silver, perhaps also in consequence of the formation of a compound indifferent to light. This non-sensitivity of chloride of silver containing $HgCl$ to the action of light is the more remarkable, as both bodies, *when alone*, are decomposed by light (Suckow, in Pogg. Ann. xxxii. p. 293).

The action of sulphate of iron is interesting. According to Wetzlar (*loc. cit. suprà*), it prevents the coloration, "although in course of time the particles situated at the margin of the vessel become slightly violet." I have confirmed this observation, but also discovered its cause, which consists simply in the fact that solution of sulphate of iron absorbs the greatest part of the chemical rays. This is easily ascertained, as chloride of silver placed beneath a vessel containing solution of sulphate of iron remains just as white as that lying in the solution.

b. *Experiments with bromide of silver.*

Whilst the influence of dilute acids upon the coloration of chloride of silver in the light of the sun is only very inconsiderable, it becomes much more perceptible in their action upon bromide of silver; and this is especially the case with regard to nitric acid. Various tubes containing bromide of silver, with acetic acid, dilute sulphuric acid, nitric acid, and citric acid, were exposed to the light, and the change undergone by their contents in a certain time was observed. By this means I found that the bromide under nitric acid acquired much less colour in the same time than that exposed with water. The retarding influence of the other acids is but inconsiderable, although perceptible. It is interesting that bromide of silver which has become grey by exposure becomes lighter in colour by standing, and still more by boiling, with nitric acid of spec. grav. 1·2. The greyish-violet mass then acquires a uniformly yellowish-grey tint. No solution of silver takes place.

Bromide of silver containing protobromide, prepared synthetically, shows the same behaviour.

c. *Experiments with iodide of silver.*

As already observed, the influence of acids upon the changes which the haloid salts of silver undergo by exposure to the sun's light is most strikingly manifested in the case of $Ag\,I^{\beta}$. I filled five tubes with $Ag\,I^{\beta}$, poured over the salt nitric acid of spec. grav. 1·2, dilute sulphuric acid (1 part water, 5 parts SO^3), acetic acid, citric acid, and water, and exposed them simultaneously to the light. Within a few minutes, differences in the coloration of the samples were clearly perceptible. The portion under water appeared of a rather deeper grey than that under the dilute acid, but that with nitric acid appeared of a pure yellow colour.

In the course of an hour the difference became still more strongly marked: the iodide under nitric acid was still pure yellow, that under sulphuric acid appeared somewhat grey, the samples with acetic and citric acids were of a deeper grey, and that under water was the darkest. After exposure for days, the portion under nitric acid also acquired a grey coloration—a phenomenon which will find an explanation hereafter.

I have stated above, that bromide of silver coloured by light is slightly bleached by nitric acid; this is the case in a far higher degree with the iodide. If nitric acid be poured over iodide of silver which has become grey, it reacquires its original pale yellow colour in a few minutes. In this case no solution of silver takes place (although a little silver is dissolved by long standing, iodide of silver being decomposed in course of time by nitric acid). Dilute sulphuric acid likewise manifests this bleaching action, though only to a small extent.

Whilst nitric acid is thus capable of considerably opposing the action of light, iodide of potassium entirely suppresses it. Schnauss found that an excess of KI rendered iodide of silver indifferent to the action of light (Photogr. Lexikon, p. 179); and this result has been confirmed by Monckhoven and Hardwich (Photogr. Archiv, 1863, p. 17). In order to repeat these researches, I poured iodide of potassium over $Ag\,I^{\beta}$: the latter immediately became pale yellow, and then did not undergo the least change by exposure to light. I also poured solution of iodide of potassium upon $Ag\,I^{\beta}$ which had become grey by exposure to light, when it immediately acquired a light yellow colour.

During the exposure of iodide of silver covered with solution of iodide of potassium, I noticed the elimination of iodine. At first I ascribed this to a decomposition of the iodide of silver, but soon found that it was due to a decomposition of the iodide of potassium. In order to prove this decomposition, I filled six tubes with a solution of 1 part of iodide of potassium in 6 parts of water, boiled them to expel the air, and closed them with plugs of wax. Three of these tubes were covered with an opake coating, and the others left uncovered; the whole were then laid in the sun. In a few hours the exposed samples had acquired a distinct yellow colour; the covered portions remained colourless. The yellow colour gradually increased with the lapse of time.

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* Such compounds of anhydrous sulphuric acid with chlorides have long been known. H. Rose, for example, has demonstrated the existence of compounds of this acid with $K\,Cl$ and $Na\,Cl$ (Pogg. Ann. xxxviii. p. 120).

I now compared the behaviour of the solution of pure iodide of potassium with that of a solution of iodide of silver in iodide of potassium. Both acquired a yellow colour by exposure to light; but this took place more rapidly with the pure solution than with that containing iodide of silver. Dry, solid iodide of potassium is not decomposed by light.

Iodized paper also is changed by exposure to light. I soaked paper in solution of iodide of potassium and dried it; on exposure, it immediately became reddish, and was then rendered blue by thin starch paste. By exposing iodized paper under a negative I obtained a yellow picture upon a white ground; it was rendered blue by starch paste.

As there are certain acids and salts which can either prevent or retard the coloration undergone by chloride, bromide, and iodide of silver when exposed to light, so there are others which, on the contrary, most decidedly favour this reaction; amongst these is nitrate of silver.

3. *Influence of nitrate of silver.*

I exposed to the light two glasses, one with chloride of silver and water, the other with chloride of silver and a silver solution (1 part AgO, NO^5, to 10 parts water). Both acquired a violet colour. In the course of an hour, however, the chloride under the silver solution appeared somewhat darker in colour than that in water; and the difference became still more distinct by longer exposure.

The favourable influence of nitrate of silver upon bromide of silver is still more striking. If the bromide be exposed to the light with water and nitrate of silver simultaneously, the considerably more intense coloration of the bromide under the silver solution is observed within a few minutes. Even in diffused light this phenomenon is striking. In direct sunlight the bromide of silver with the nitrate becomes deep blackish grey, with a shade of violet.

Iodide of silver, like the bromide, acquires a much more intense colour when in contact with nitrate of silver than without it. If two portions of iodide of silver, one with water, the other with nitrate of silver, be exposed together to the light, the latter becomes deep grey, with a greenish tinge, within a few minutes, whilst the former only becomes pale grey. The deeper coloration of the iodide occurred also with dilute solution of nitrate of silver. I took four portions of iodide of silver, and poured over three of them solutions of nitrate of silver, of the strengths 1 : 20, 1 : 40, and 1 : 100; the fourth received only water. The samples, when exposed, became coloured more deeply in proportion to the concentration of the solution; but all were darker than the sample in water. The difference between those with nitrate of silver was not, however, very considerable, and only made its appearance more distinctly after the lapse of some days. If bromide and iodide of silver, both with nitrate of silver, be exposed to the light, the bromide is seen to become coloured much more intensely than the iodide.

For the elucidation of these phenomena, I examined into the behaviour of nitrate of silver by itself in the light. I exposed simultaneously three glasses with silver solutions, of which one contained 10, another 5, and the third 2½ per cent. of nitrate of silver. After exposure for some hours to the light of the sun, all the glasses showed a small quantity of black points, which did not increase by longer exposure; these became white and silvery when pressed with a glass rod; and when the silver solution was removed by decantation and washing, they dissolved completely in nitric acid. This solution became turbid with hydrochloric acid. Solution of nitrate of silver is therefore decomposed in the light, with separation of silver. Schnauss*, Hardwich†, and others assert that solution of nitrate of silver is not decomposed by light unless organic substances be present. I have, however, frequently repeated the above experiments with pure fluids and clean glasses, and always detected a separation of black granules of silver.

On the other hand, solid nitrate of silver, if pure, remains unaltered by the light, as has already been observed by Scaulan (Pogg. Annal. xlvi. p. 632). I consider that the decomposition of nitrate of silver is not a direct one. Supported by the fact, discovered by me, that carbonate and oxide of silver, when exposed to the light, are reduced to protoxide, which is decomposed by acids into silver and oxide of silver, I believe that AgO, NO^5 is likewise first reduced to protoxide, but that the nitric acid thus set free exerts a decomposing action upon the latter, and thus produces metallic silver.

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* Photographisches Nachschlagebuch, p. 303.

† Manual of Photographic Chemistry, p. 18.

The decomposition of nitrate of silver thus produced by light is, however, too inconsiderable (the silver granules can frequently be detected only by the lens) to explain the intense coloration which is undergone by iodide and bromide of silver when exposed to the sunlight under a silver solution. But I have ascertained that silver is actually separated during the exposure of bromide of silver covered with solution of nitrate of silver, by thoroughly and carefully washing the bromide of silver until the washing-water no longer gave a reaction of silver, and then boiling the salt with nitric acid; the entire mass became paler, and the nitric acid gave a distinct silver reaction.

The bromide left after boiling with nitric acid had, however, a much darker appearance than pure bromide exposed for an equal time,—proving that, during exposure under nitrate of silver, not only is silver set free from the latter, but the reduction of the bromide of silver is decidedly assisted, and that the darker coloration results from this double action.

With chloride of silver, also, when exposed under nitrate of silver, a separation of silver takes place, as I ascertained in the same way.

In the case of iodide of silver, the free silver cannot be detected by boiling with nitric acid, as the iodide itself is decomposed thereby; but, from analogy with the bromide and chloride, it is very probable that the same decomposition takes place here, and I even succeeded in detecting the silver in a portion of iodide exposed for several days with a solution containing 5 per cent. of nitrate of silver, by pouring over it a solution of hyposulphite of soda and thus dissolving the iodide of silver. There remained a very small quantity of greyish-black granules, which, after long washing and decantation, dissolved in nitric acid, and gave a silver reaction with hydrochloric acid. With reference to the behaviour of iodide of silver towards nitrate of silver and nitric acid, its final acquisition of a grey tint under nitric acid cannot surprise us. The acid in time decomposes a portion of the iodide, and the grey coloration is produced in contact with the nitrate of silver thus formed. The intense coloration undergone by iodide of silver under nitrate of silver has induced Schnauss to assume the existence of a particularly sensitive compound of $Ag\,I + Ag\,ONO^5$. He found that from a boiling solution of iodide of silver in the most concentrated solution of nitrate of silver silky crystals are deposited, and that these are very rapidly blackened by exposure to light, and consist of $Ag\,I + Ag\,ONO^5$ (Archiv der Pharm. cxxxii. p. 260).

Sutton and Schnauss have also set up the opinion that the sensitivity of iodide of silver is always caused by the retention of a trace of nitrate of silver, which is not to be got rid of even by long washing (Schnauss, Nachschlagebuch, p. 144).

I cannot quite agree with either of these views. For the compound $Ag\,I + Ag\,ONO^5$ is decomposed by the addition of water, and therefore cannot be supposed to exist in solutions of $1 Ag\,ONO^5$ in $10–100 HO$, such as I employed; nevertheless iodide of silver is blackened energetically in such solutions. The compound $Ag\,I + 2Ag\,ONO^5$ also, which was investigated by Risse *, Weltzien, and Riche†, cannot exist in such solutions. This applies also to the compounds of bromide with nitrate of silver described by Risse.

Hence I ascribe the increased sensitivity to light of bromide and iodide of silver in contact with solution of nitrate of silver simply to an action of contact. In the case of chloride of silver, the heightening of the coloration by the same means is so inconsiderable that it may be ascribed solely to the slight decomposition of the nitrate which takes place.

I must likewise deny that the sensitivity to light of iodide of silver is due to a trace of nitrate retained in spite of long washing. I took paper soaked in $Ag\,I^\beta$, and well washed with water (the mode of preparation of which shall be described below), and laid it for five minutes in a solution of 5 per cent. of chloride of sodium. If a trace of nitrate were contained in the iodide of silver, it must thus evidently have been converted into chloride of silver. The paper thus treated was well washed and exposed to the light. It behaved exactly like similar paper not treated as above with chloride of sodium. Hence I conclude that a trace of nitrate in the iodide of silver is not the cause of its sensitivity.

In the preceding pages the chemical changes which chloride, bromide, and iodide of silver undergo in the sunlight, either by themselves or in contact with various substances, have been fully discussed. The results of the investigations may be briefly summed up as follows:—

1. Chloride of silver, prepared with an excess either of the silver salt or of hydrochloric acid or chloride of sodium, is decomposed by light, and acquires a violet (*not black*) colour; it sets free chlorine, and leaves a subchloride (but *no silver*, as asserted by Davanne, Spiller, Malone, and others).

2. This decomposition takes place even in

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* Journal für prakt. Chem. xxxiii. p. 343.

† Liebig's 'Annalen,' cxi. p. 89.

the absence of all moisture, and beneath concentrated sulphuric acid and nitric acid (in opposition to Seebeck's statements).

3. Chloride of mercury ($HgCl$) and fuming sulphuric acid entirely prevent the decomposition by the sun's light. English sulphuric acid and nitric acid only retard it.

4. Solution of sulphate of iron likewise retards the action of light upon chloride of silver (Wetzlar). The cause of this is the absorption of the chemical rays by this solution.

5. Solution of nitrate of silver slightly favours the coloration of chloride of silver in the light. In this case, besides subchloride, free silver is produced, certainly in consequence of the decomposition of the nitrate.

6. Bromide of silver, prepared with an excess either of silver solution or of bromide of potassium, acquires by exposure a pale greyish-violet colour, weaker than that of chloride of silver; it gives off bromine, and leaves a subbromide of silver.

7. This subbromide of silver is decomposed by ammonia, furnishing metallic silver and a solution of bromide of silver.

8. Nitric acid retards the decomposition of bromide of silver by light much more than that of chloride of silver.

9. When heated with nitric acid, the greyish violet [exposed] bromide of silver becomes yellowish grey and lighter, without any silver being dissolved.

10. Solution of nitrate of silver greatly assists the decomposition of bromide of silver by light; under it the bromide very soon becomes intensely greyish black. In this case not only subbromide, but also metallic silver is separated.

11. Chloride of silver precipitated from an excess of silver solution is decomposed more rapidly in the light than bromide of silver precipitated from an excess of silver solution. Chloride of silver precipitated with an excess of chloride of sodium, on the contrary, is decomposed more slowly than bromide thrown down by an excess of bromide of sodium.

12. Iodide of silver precipitated by an excess of iodide of potassium is not in the least affected by light.

13. Iodide of silver precipitated from an excess of silver solution becomes pale grey by exposure to light. No iodine is set free, and a chemical decomposition is consequently very improbable.

14. Acids (even when diluted) retard the coloration of iodide of silver in the sunlight; the retardation is most considerable with nitric acid, less with dilute sulphuric acid, and still less with acetic and citric acids.

15. Nitric acid (of spec. grav. 1·2) bleaches iodide of silver which has become grey by exposure to light, and reproduces the original colour, without, however, dissolving any silver. Sulphuric acid only renders the colour lighter.

16. Solution of iodide of potassium instantly renders the deep-yellow iodide of silver, precipitated from an excess of silver solution, pale yellow, and insensitive to light; iodide of silver rendered grey by exposure becomes pale yellow by treatment with iodide of potassium.

17. Nitrate of silver favours the coloration of iodide of silver exposed to light in a high degree; it becomes of a deep greenish-blackish grey.

18. When the three salts, bromide, chloride, and iodide of silver are exposed to the sunlight in contact with nitrate of silver, the bromide acquires the most intense colour, and the chloride the weakest.

19. Nitrate of silver in the solid form, and when pure, is not decomposed by light; from its solutions a small quantity of silver separates in fine black granules.

20. Iodide of potassium likewise is not decomposed when exposed to light in the solid state; but when dissolved, iodine is soon evolved from it.

In the preceding sections the chemical changes undergone by chloride, bromide, and iodide of silver in the light of the sun have been described in detail. By this means, however, the photographic processes are by no means explained. In these, very different reactions come in question; for the picture upon the photographic plate is not produced by a *visible* action of light, such as the change of colour undergone by the haloid salts of silver when exposed to light. On the contrary, the stratum of iodide or bromide of silver, after short exposure in the camera, does not show the least trace of a picture, but this makes its appearance only after a solution of sulphate of iron or pyrogallic acid (the so-called developing fluid) has been poured over the coat of silver. For the elucidation of these phenomena, the third question proposed above must be answered.

III. *What changes are undergone by bodies affected by light in the so-called developing-process?*

For the solution of this question many important investigations have already been made, by Schnauss, Hardwich, Monckhoven, Davanne, and others.

Schnauss ascertained that a film of *pure* iodide of silver, after exposure, was not in the least affected by *pure* gallic acid, but that the picture is produced by gallic acid upon a film of iodide of silver saturated with solution of silver. He says that the exposed iodide of silver possesses the faculty of attracting and retaining the particles of silver reduced by gallic acid from the solution of silver. By this means the basis of a scientific explanation of the photographic process was furnished. Hardwich, Monckhoven, Davanne, and others carried Schnauss's explanation still further. They proved that the picture did not make its appearance upon an exposed film of pure iodide or bromide of silver by the action of pyrogallic acid or sulphate of iron, but that it did appear when, besides the substances just mentioned, silver solution was applied to the plate* (Hardwich, Manual, p. 41; Davanne, Chimie Photogr. p. 82; Monckhoven, *loc. cit.*), and therefore explained the production of the photographic picture by a *molecular attraction* exerted by *insolated* iodide of silver upon the reduced particles of silver,—although they differed in opinion as to the change which iodide of silver itself undergoes when exposed to the light. I have also made some experiments upon this subject, especially with the object of ascertaining more accurately the condition in which silver separates in the reduction of its salts in the humid way. I ascertained that silver is produced by this means in two varieties† :—

1. As a coherent speculum, which deposits itself on the walls of the glass vessel as the reduction takes place.

2. As a grey or black powder, which appears under the microscope either as a regular arborescent crystallization or as an aggregation of very fine granules of irregular form. I called the latter variety *granularly pulverulent* silver.

Such granularly pulverulent silver is produced, for example, by itself when a solution of sulphate of iron or pyrogallic acid is mixed with a solution of silver, and simultaneously with a silver speculum during the reduction of an ammoniacal solution of silver by tartaric acid or sugar of milk. I ascertained that the granularly pulverulent silver, in the act of separation, has a great tendency to deposit itself on rough spots in the glass, and that in this way, during the silvering of mirrors by means of tartaric acid or sugar of milk and a solution of silver, it caused the formation of spots, and thus became an injurious subsidiary product in that operation.

The reverse is the case in photography. Here it is an important primary product, as by its deposition on the parts of the film of iodide of silver affected by light it causes the appearance of the picture. "Photography and the silvering of mirrors are in a certain degree similar arts, both depending on the reduction of silver salts to metallic silver. In coating mirrors the object is to produce a *uniform* precipitate of specular silver, and to avoid as much as possible the precipitation of the granularly pulverulent form; in photography, on the contrary, we seek to produce upon the exposed plate an *unequal* precipitate of granularly pulverulent silver, in accordance with the illumination." That the black substance which forms the photographic negative is really metallic silver may be proved at once by pressure or rubbing with the finger-nail or a glass rod. By this means it is rendered white and silvery.

From these investigations it is sufficiently demonstrated that the sensitive film acquires, by insolation, the property of attracting and retaining nascent granularly pulverulent silver; but as to the cause of this singular property opinions are divided.

Davanne maintains that this property of exposed iodide of silver depends on its being decomposed into iodine and silver, and the silver thus set free having an attractive action upon the particles of silver in the developing fluid. He founds this opinion upon an experiment of Young. Young exposed a plate with albuminized iodide of silver in the camera, dissolved *all* the iodide by means of hyposulphite of soda, and then treated the plate with the developing fluid. *Although all* the iodide of silver was removed, this still caused the appearance of a picture; but if the plate was previously treated with nitric acid, no picture appeared. Davanne explains this phenomenon by the setting free of silver during the insolation of the iodide. This silver remains, according to him, after treatment with hyposulphite of soda, and serves for the production of a picture (Barreswille and Davanne, Chimie Photogr. p. 82).

[To be continued.]

REPORT OF JURORS.

[Concluded from p. 50.]

PICTURES.

We have already seen that great strides have been made in photography in the superiority of its processes, in the increased certainty which has been obtained by regard to the chemical condition upon which success depends, in the improvement of its apparatus, and the widened scope of its appliances, aided by increased skill in the manipulatory details. We now proceed briefly to refer to some of the examples of the various applications in which this progress is strikingly manifest.

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* This silver solution, however, need not, as in Schnauss's experiment, be upon the plate *during* its exposure.

† Bericht der Berl. Akad. der Wiss., May 22, 1862; also Poggendorff's 'Annalen,' cxvii. p. 316.

Portraiture, as the most universal branch of the art, claims first attention; and here, in pure untouched photography, requiring no aid from the pencil of the artist, the most striking advancement has been made. Preeminent in this style are the vignette-portraits of T. R. **Williams** (*United Kingdom*, 3182), to whom a Medal was awarded. In these, by the judicious arrangement of light, exact chemical conditions, skilful manipulation, and artistic management, a delicacy and perfection of representation is attained which at one time would have been regarded as impossible without the after-touching of the pencil. Possessing many of the same qualities, combined with a richness and depth of tone due to the mode of printing known as the ammonio-nitrate process, are the portraits by T. H. **Hennah** (*United Kingdom*, 3093). Similar in quality and in many points of excellence, but of larger size and bolder style, may be mentioned the portraits of M. **Ken** (*France*, 1500). In all these and some others, delicacy is combined with great brilliancy, and those qualities which painters obtain by elaborate finish are here secured by skilful manipulation guided by artistic judgment.

Another order of excellence, in which bold artistic conception is manifested with less attention to delicacy of manipulation, is illustrated by the productions of D. O. **Hill** (*United Kingdom*, 3096), whose portrait-groups possess great merit.

The portraits of Ross and **Thomson** (*United Kingdom*, 3148) possess much of the freshness of design, and demonstrate that photographic portraiture need not be confined to the production of lifeless facial diagrams.

Untouched photographic portraiture possessing many excellent qualities, both artistic and manipulatory, is exhibited by M. **Alophe** (*France*, 1462), and by M. **Nadar** (*France*, 1498), some of whose impressions have the additional interest of having been printed by means of the electric light.

M. **Angerer** of *Vienna* (*Austria*, 670) exhibits a series of very large portraits in groups, vigorous, brilliant, and artistic; they illustrate the fact that the highest qualities are not incompatible with an amplitude of size not usually attempted in photographic portraiture.

R. **Striegler** (*Denmark*, 133) contributes many portraits of similar excellence to those described: one possessing an especial interest at the present moment in the eyes of the nation is a portrait of the Princess of Denmark, in which the charms of the photograph are much enhanced by the beauty, grace, and intelligence which it so faithfully depicts.

Meriting attention from the amazing popularity which it has attained, and the great impetus it has given to photographic portraiture, is the style known as *cartes de visite*, or visiting-card portraits.

Photographs of a similar size and style were amongst the earliest examples of the collodion process, but were then undistinguished by any especial title. The name by which they are now known, and their introduction to the public as a distinct class, for which a *furore* soon began to prevail, is due, it is stated, to M. **Disderi**, a Parisian photographer of great eminence, in whose hands these small portraits attain great excellence and variety.

The accounts recorded at various times of the numbers of these portraits produced in different establishments appear almost fabulous; it may be safely affirmed that they have attained a popularity and extent of circulation altogether unparalleled in the history of pictorial art. The albums especially prepared for their reception, and which are now found in almost every household, have become a distinct and important branch of manufacture, and even the production of scenic backgrounds and other accessories for the photographer's studio are amongst the distinct pictorial characteristics creating a separate branch of trade.

Taking precedence in this style, in the British photographic department, are the productions of Mr. H. P. **Robinson** (*United Kingdom*, 3147), whose card-portraits possess great beauty as artistic studies, apart from their interest as portraits.

Mr. W. **Mayland** of *Cambridge* (*United Kingdom*, 3125) also claims a notice for the excellency of his pictures in this department.

Messrs. Ross and **Thomson** of *Edinburgh* (*United Kingdom*, 3148), and **Mullins** of *Jersey* (*United Kingdom*, 3188), deserve notice for their examples in this style. The small pictures of **Angerer** of *Vienna* (*Austria*, 670) are not less perfect than his larger ones, of which we have already spoken.

Many other contributors of this style of photograph display high qualities, whilst some, it is to be regretted, are shown which illustrate how imperfectly an art distinguished generally by its truth can be practised; a series of card-pictures by **Birnstingl**, purporting to be the portraits of the Guarantors of the International Exhibition, strikingly illustrates this bad eminence to which reference is made.

An interesting feature in the various displays of photographs consists in the pictures of life-size, produced either directly in the camera or by enlargement from small negatives by means of the solar camera or other similar appliances.

Mr. **Angel** (*United Kingdom*, 3032) and Messrs **Smyth** and **Blanchard** (*United Kingdom*, 3157) exhibit some fine enlargements.

The contributions in this style from different Continental artists comprise specimens of unsurpassed beauty, M. **Disdéri** of *Paris* (*France*, 1461) showing some enlargements in which the perfection of definition is in every way satisfactory.

M. **Alophe** (*France*, 1462) also shows a series of very large heads, stated to be produced without enlargement, possessing unusual vigour without the coarseness too often found in these large photographs.

M. **Numa-Blanc** (*France*, 1494) contributes some very fine amplified proofs of great excellence, which are interesting from the fact that the source of illumination in enlargement was not the solar rays, but the electric light.

M. **Darlot** (*France*, 1491), to whom a Medal has been awarded for his lenses, is much indebted to them for the excellence of the large proofs exhibited by him in illustration of their powers.

MM. **Ghemar** of *Brussels* (*Belgium*, 358), amongst other fine pictures, exhibit an enlarged portrait of the Comte de Flandres—a standing figure from a visiting-card portrait, enlarged to about twelve diameters, which for perfection and delicacy in every part is unsurpassed by any exhibited. **Hansen** of *Copenhagen* (*Denmark*, 127), **Wothly** of *Aix-la-Chapelle* (*Prussia*, 1435), and some others exhibit also enlarged prints which are highly satisfactory.

Another class of photographs very popular with the public, but which at a time when the art has obtained such perfection scarcely possesses the same claim to photographic excellence as those already named, are the touched pictures, or those which owe something to the finishing pencil of the artist, who corrects supposed faults, and supplies deficiencies with a pigment approaching as nearly as possible to the neutral tint of the photograph. In some instances this is not all, as the old picture is remodelled, the photograph merely subserving as a basis for a picture in sepia or indian ink.

Of this class are some of the portraits exhibited by Mr. **Mayall** (*United Kingdom*, 3123), which have every appearance of possessing much photographic excellence, being very carefully worked in imitation of a mezzotint engraving by the artist.

Another section of touched portraits are those exhibited by **Herbert Watkins** (*United Kingdom*, 3177), by **John** and **Charles Watkins** (*United Kingdom*, 3178), and by Messrs. **Maull** and **Polybank** (*United Kingdom*, 3122).

Many of these are good untouched photographs; but mixed with them are many more which are worked on, not to the extent of those just described, but still sufficiently to destroy their claim to consideration as specimens of pure photography.

Amongst others exhibiting pictures of merit in this class are **Bassano** (*United Kingdom*, 3036), **Barnes** (*United Kingdom*, 3034), H. N. **King** (*United Kingdom*, 3109), together with others, and it may be proper here to state that it was the original intention of the committee of advice appointed by the Royal Commissioners to exclude rigorously all specimens of this class. The published conditions definitely stated that such pictures would not be admitted; it was decided, however, at the last moment, when a great many examples of this class were sent in, to give them a place in the department rather than leave a bare space on the walls which had been allotted to the gentlemen who had sent such pictures as their contributions. Coloured portraiture, with the photograph as a groundwork, whilst not strictly entirely belonging to the art, has hitherto been associated with it as one of its lucrative and proper applications, and some very fine examples of such are exhibited in the British department. A member of the Jury holds a prominent position, especially in enlarged portraits coloured in oil: these pictures are not strictly speaking photographs, but are produced by the use of a small photographic negative and an enlarging camera, the image being projected on the canvas, and traced by hand instead of by chemical agency; the outlines thus obtained are subsequently finished by the painter.

Mr. **Kilburn**, Mr. **Mayall**, and Mr. **Williams** exhibit also some very effective oil-coloured photographs, a great charm in which is the fact that whilst acquiring the beauties of colour they have not lost the distinctive truth of photography.

Messrs. **Gush** and **Ferguson** (*United Kingdom*, 3084), and **Lock** and **Whitfield** (*United Kingdom*, 3115), have photographs coloured in water-colours, on which the most elaborate skill of the miniature-painter is expended, giving them qualities in which they rival the best-executed ivory miniatures of the past age. The coloured specimens of **McLean**, **Melhuish**, and **Hayes** (*United Kingdom*, 3120) are very distinct, and their excellence demands every praise. The picture contributed by Mr. B. R. **Green** (*United Kingdom*, 3081) has also distinct features of considerable merit.

Messrs. **Heath** and **Beau** (*United Kingdom*, 3090) have charming miniatures, in which the aid of colour is secured with less elaborate manipulation, and a more perfect retention of the photographic character of the portraits.

Mr. A. Brothers (*United Kingdom*, 3051) exhibits a remarkably finely coloured miniature photographed upon ivory, and a large group tinted in water-colours with great skill; he also exhibits an excellent example of what is known amongst photographers as composition-groups, consisting of an assemblage of twenty-two portraits of eminent members of the Association for the Advancement of Science. The capability of the photographer's art in correctly defining groups of several persons on a large scale is limited by the powers of his lens. To meet the difficulty a method of printing from several negatives, originating with Mr. Rejlander, is adopted. The print to which reference is made was printed, at thirty-seven different operations, on paper 36 inches by 24 inches. Each negative must of course be designed for its position in the picture from the first; and although each portrait may be taken without the presence of any other member of the group, the proper relation of size must be regarded throughout, so as to produce harmony in the finished pictures. The skilful blending of the separate portraits of this group into one harmonious whole is very satisfactory.

Also associated with portraiture a variety of photographs are exhibited, which possess great value and interest as ethnological illustrations, especially a series of Indian portraits of native tribes, together with several volumes, exhibited in the French department.

Allied to portraiture, and more closely trenching upon the domain of art, is the production of *genre* pictures. Of these the productions of Rejlander (*United Kingdom*, 3145) and Robinson (*United Kingdom*, 3147) take first rank. In Mr. Rejlander's photographs the most remarkable feature is the perfect rendering of an idea; each picture tells its story without explanation, the models seem perfectly easy in his hand, and the artist does not seem more fettered by his camera and chemicals than he would be by his palette and pencil.

Superior in precision and excellence of the photographic manipulation, and no less excellent as artistic productions, are the pictures of Mr. H. P. Robinson, several of which are printed from many negatives. "Fading away," "She never told her love," and many others have obtained a world-wide reputation.

In *landscape* and *architecture* the progress of photography is illustrated in a most satisfactory manner, as well in the results of the wet- as the dry-collodion processes. The pictures of Mr. Bedford (*United Kingdom*, 3039) possess a degree of excellence beyond which it would seem impossible to go. In his productions are admirably united great artistic excellence with perfect command of his materials. His interiors are probably the finest which have ever been obtained by photography, and illustrate the importance of a cultivated knowledge in the selection of time, light, and position.

Mr. Henry White's (*United Kingdom*, 3179) are perfect landscapes, strongly exemplifying the value of artistic feeling in the prosecution of the art.

Mr. Vernon Heath's (*United Kingdom*, 3091) photographs show the high degree of excellence attained by studying the manipulatory details of the process.

Mr. Dixon Piper's (*United Kingdom*, 3135) views have all those charming characteristics which give value to pictures of English landscape scenery.

Dr. Hemphill's (*United Kingdom*, 3092) photographs relating to Irish antiquities are highly interesting.

The Viscountess Jocelyn, Sir A. K. Macdonald, and the Earl of Caithness send contributions which illustrate that in the amateur pursuit of an elegant accomplishment results may be obtained which rival in all excellence the works of the most able of those who practise the art as a profession.

In many of the contributions of the Amateur Photographic Association the same fact is illustrated.

Amongst the contributors who practise dry photography are many whose pictures show that dry plates in skilful hands yield results equal to wet collodion. Mudd, Sidebotham, and Wardley send illustrations of this kind, in which delicacy and softness are secured without any sacrifice of vigour and effect.

Without entering into lengthy detail or comparison where so much excellence exists, the names of Roger Fenton, Frith, Stuart-Wortley, D. Campbell, Lyndon Smith, B. B. Turner, and others, may all be mentioned as admirable illustrations of the excellence which has been attained in the branch of landscape-photography.

Most satisfactory illustrations of the advancement of the art are shown in the display of instantaneous photographs, stereoscopic and otherwise.

In the production of marine subjects—sea, shipping, clouds, and atmospheric effect—it seems as if little remained to be accomplished, as the pictures of G. W. Wilson, Blanchard, and of C. Breese (*United Kingdom*, 3049) exemplify. The exquisite transparent stereographs contributed by the latter gentleman possess photographic and artistic beauties quite unsurpassed: every drop of water in breaking waves or foaming cataracts is reproduced by an operation perfectly instantaneous, and with a transparency beyond comparison. The sea-gull is arrested on the wing, the balloon depicted in its ascent, whilst foreground and distance, sea and cloud, are each at the same time perfectly rendered. The effects of sunset and moonlight are beautifully given; and to add wonder to beauty, images of objects photographed by the light of the moon alone are amongst his contributions. It may be interesting to state in connexion with these pictures that, instantaneous as they manifestly are, no other contrivance but a cap held in the hand was used for covering and uncovering the Dallmeyer lens, thus showing the rapidity of the motion of the human hand and the simple way of overcoming what has been thought so difficult a matter.

The street-scenes of Mr. England (*United Kingdom*, 3117), executed for the London Stereoscopic Company, are perfect and beautiful, especially those of his views in Paris.

As not inferior to the majority of the contributions of this kind must be mentioned the instantaneous pictures of Warnod of *Havre* (*France*, 1548). They are of a size larger than the majority of instantaneous productions, consisting of sea, cloud, and shipping, possessing a delicacy and vigour with perfection of definition in the highest degree satisfactory.

Reproduction is another interesting and valuable branch of the art which has attained a very high state of perfection, some excellent illustrations of which are exhibited.

The magnificent copies of the cartoons of Raphael, produced respectively by a member of the Jury and Mr. Caldesi (*United Kingdom*, 3061), cannot well be overrated. Mr. Caldesi's copies of the Phidian marbles rank amongst the most valuable applications of the photographic art.

Mr. Downes's map (*United Kingdom*, 3068) and other reproductions of engraving are perfect. The enlargements of Mr. Warner (*United Kingdom*, 3176) are most excellent.

The obtaining of fixed natural colours by means of photography still remains, as was before remarked, to be accomplished; but the Jurors have pleasure in recording that some very striking results of experiments in this direction were forwarded for their inspection by a veteran in photographic research and discovery, M. Niepce de St. Victor. These, about a dozen in number, 3½ by 2½ inches, consisted of reproductions of prints of figures with particoloured draperies. Each tint in the pictures exhibited, they were assured, was a faithful reproduction of the original. Amongst the colours were blues, yellows, reds, greens, &c., all very vivid. Some of the tints gradually faded and disappeared in the light whilst under examination, and a few remained permanent for some hours. The possibility of producing natural colour thus established is a fact most interesting and important, and too much praise cannot be awarded to the skilful research which has been to this extent crowned with success. The Jury record their obligations to their chairman, Baron Gros, at whose personal solicitation they were enabled to obtain a sight of these remarkable pictures.

We now approach, for very brief notice, a variety of contributions illustrating several very important applications of photography. First amongst these may be mentioned the photolithographic process of Mr. Osborne, the photozincographic process of Col. Sir H. James, the photographic process of Mr. Fox Talbot, and the processes of Mr. Paul Pretsch for producing, by the combined aid of photography and electricity, plates for printing, either in intaglio or relief. In all these the impression is produced in printers' ink, and by the aid of the ordinary letter-press, lithographic, or copper-plate presses; all the facility for rapid reproduction of the prints, and all the permanency, or indeed, as far as the impression is concerned, the indestructibility, of ordinary prints or engravings, are in the productions under notice secured. Mr. Osborne (*Victoria*, 308) exhibits specimens by his process of the official colonial maps and plans of Victoria. All these are for the purposes required faultless, and consist of reproductions of the original plans, &c., in the same size and on amplified and reduced scale, any proportion to the original being, of course, easily obtained, and with perfect accuracy. For such purposes his process has attained its utmost limit of perfection. The productions of Col. Sir H. James (*United Kingdom*, 3101), of a similar character, and applied to similar purposes, are not less perfect. The specimens exhibited consist of copies of the Ordnance maps, Hogarth's engravings, a page of an early edition of Shakspeare, Pyne's Horace, &c.; also specimens of the transfers of the zinc plates, &c., illustrating different stages of the process. In a process based upon the same principle, and styled by Col. James photopapyrography, the sheet of paper is made to serve the purpose of the plate of zinc or lithographic stone, and, where a small number of impressions only is required, answers every purpose, as the specimens contributed show. The specimens of Mr. Paul Pretsch (*United Kingdom*, 3140), both of block-printing and intaglio printing, are very interesting, and in many instances exceedingly fine. We may mention as especially worthy of notice a print of the Venus of Milo and the portrait of a child, engraved by this process and printed by means of the copper-plate press. These plates have received a little aid from the burin of the engraver, and render exceedingly satisfactory pictorial effect. The specimens of Mr. Fox **Talbot's** (*United Kingdom*, 3167) photographic process are very interesting; but his method has not received that practical attention by which results of high pictorial excellence have been attained. Mr. **Ramage** of *Edinburgh* (*United Kingdom*, 3143) contributes some of the most perfect specimens of lithophotography in the Exhibition, consisting of the reproduction of engravings. The process by which they are produced is not stated, but is understood to consist in a modification of the processes of other discoverers. MM. **Poitevin** (*France*, 1508), **Lemercier** (*France*, 1501), and some others in the French court also exhibit fine specimens of photolithography.

Based upon a similar principle, but of less economic importance, are the various carbon-processes. The specimens produced in this country have not yet attained a degree of excellence which renders them of much practical value. The most perfect process of which any specimens are exhibited are those by the method of Mr. **Joubert** (*United Kingdom*, 3105), styled the phototype-process. Some of these are very good, and the rate of production is stated to be very rapid, but the details of the method are not made public. In the French department, specimens of very high excellence are exhibited. Amongst the contributors here, first, is the honoured name of **Poitevin**, to whose research much of what has followed is due. MM. **Fargier**, **Garnier** and **Salmon**, **Charavet**, and **Carmarsac**, and others also exhibit carbon-prints of much excellence, a detailed notice of which, however, would occupy too much space here. M. **Leth**, and some others in the Austrian department, also exhibit very fine carbon-prints.

The exhibitors of photographs in enamel or vitrifiable colour are not numerous, but many of the specimens are very fine. Mr. **Joubert** exhibits in the British department a number of large pictures enamelled on plates of glass, some of which are in monochrome, and others in a variety of tints, and are produced in some instances from negatives direct from nature, and in others consist of reproductions of engravings. A very high degree of excellence is obtained in many of them, and it is probable that an extensive application of the process for decorative purposes will ere long be made. M. **Lafon de Carmarsac** (*France*, 1506) exhibits some very charming photographic enamels, the application of which is in a different direction to those of Mr. Joubert. M. **Carmarsac's** specimens chiefly consist of miniature portraits. It is impossible to overrate the delicacy and perfection of many of these examples.

The application of photography to textile materials is very interesting, although its objects have yet to be developed. Madame **Lafon** exhibits some charming specimens on white silk, in which the photography and the designs possess much merit. In the Italian department some similar specimens were added after the conclusion of the Jurors' labours.

The applications of photography to the progress of astronomical science are not so numerous in the present Exhibition as the interest and importance of the subject might have rendered desirable. Mr. **Warren De la Rue** (*United Kingdom*, 2893) exhibits a series of his valuable photographs, recording the various phases of the total eclipse of the sun of 1860, which were produced in Spain in conjunction with the expedition sent out expressly for observing and recording the various phenomena in connexion with that event. Several important points which up to that period were the subject of considerable uncertainty and debate were effectually and indisputably established by the aid of these photographs, and which, without their evidence, must still have remained undecided. Mr. De la Rue also exhibits his photographs of spots on the sun and of the moon in various phases. Mr. **Beckley** (*United Kingdom*, 3009) also exhibits a series of photographs of much interest, showing the spots on the sun at various periods.

The application of photography to the production of the enlarged images of the microscope receives many valuable illustrations, the exhibitors of which can, however, only be briefly chronicled here. Mr. **Reeves Traer** (*United Kingdom*, 3171) and Mr. **Olley** (*United Kingdom*, 3132) exhibit prints on paper from large negatives of minute objects taken through the microscope. M. **Lackerbauer** (*France*, 1558) exhibits some exceedingly fine enlarged microscopic images, as transparencies on glass. M. **Roncalli** (*Italy*, 1249) exhibits some fine enlarged images on paper. In addition to these, some interesting specimens are shown in which the inverse result is produced. These consist of reduced copies of pictures for microscopic examination: the results, although partaking of the character of toys, may yet become of important application. Mr. **Reeves** (*United Kingdom*, 3144), Mr. **Stovin** (*United Kingdom*, 3163), and M. Dagron (*France*, 1545) exhibit interesting specimens in this class.

In reference to the productions of many of the colonies, the Jurors have not space to enter into detailed notice; they may mention, however, that in many instances in their awards of merit to colonial exhibitors they felt that recognition of the circumstances under which the contributions were produced was necessary, and that a less amount of excellence here was worthy of mention than would have sufficed to secure it where the facilities for good results were more accessible.

The Jurors, in terminating their Report, cannot conclude without stating their conviction that, rapid and important as the progress of photography has been since the Exhibition of 1851, it affords promise of still wider development and still more important results, both in the stations it already occupies and in others it is yet destined to fill. Much of the progress already attained has been due to the disinterested exertions and research of individuals, but they may add their conviction that still more may be attributed to the influence of the Photographic Society. This Society (founded under the august auspices of the late lamented Prince Consort, who to the period of his death continued its patron and took the deepest interest in its welfare), and the minor associations of a similar character which have since sprung up, have, by concentrating and fostering the exertions of individuals, contributed in a degree not easily calculated to the present high position of the art. The exhibitions of the Photographic Society, held from year to year, have been at once the incentives to exertion and the landmarks of progress during the past, and will doubtless continue to exercise a still more marked influence on the future; and the Jurors of the next International Exhibition will probably be called upon to chronicle results to which those now recorded bear but a small proportion in beauty, vastness, and importance.

HUGH WELCH DIAMOND, Reporter.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

Having in our last Number omitted a paragraph of Mr. Baynham Jones's letter in which Mr. Sutton's name is mentioned, preceding the words "presuming to differ with that gentlemen," we beg to apologize to Mr. Jones for this oversight.

A. A.—'Gutch's Scientific Pocket-book,' we believe, has been discontinued since the death of the editor; you will find, however, the definition in the different Photographic Almanacs. In the 'Silver Sunbeam,' published by Atkinson, of Liverpool, there is a chapter on French and English weights and measures.

Amateur.—The very beautiful results which Mr. Cooper has produced, are effected by masks made by himself; you are recommended to write to that gentleman. Small ones, adapted for the carte de visite, are procurable at any dealers in photographic apparatus. The vignette glasses first used were very superior to those in present use. They were formed of dark-coloured glass, and the centre gradually ground so as to produce an equal shade. No doubt, in many instances very artistic results are produced by the use of vignettes; but it is often adopted to hide the defects in negatives and want of definition at the margins, especially where too small a lens is used for the size of the picture required. 2. Sugar of milk, grape-sugar, glycyrrhizine, &c., are not used at the present day in the manufacture of collodion.

Carbon Prints.—There are two specimens of Mr. Swan's process in the Exhibition. We think the portraits he exhibited before the Society were even relatively superior to the landscapes. Mr. Bingham, of Paris, exhibits four carbon portraits, which are perfect in every respect. 2. The photogalvanographic process is entirely extinct as a commercial speculation, unless Mr. Dallas's process may be so designated. We have lately seen some of the best of the Photogalvanographic Company's plates sold as old copper. Many of those who unfortunately joined the Company were great pecuniary losers thereby, becoming responsible for the actions of others.

Y.—The vibration from traffic in the street is quite sufficient to produce the blurring you refer to, and you need not seek for any more scientific cause.

W. S.—The price of printing a picture 4 × 3 inches would probably be threepence or fourpence. There is great competition. The print of the Crucifixion, by Bisson Frères, was sold for 16*s.*, and larger impressions for £2 12*s.* 6*d.*

F. B., Eastbourne.—A great deal of nonsense has been written on the subject of the construction of the glass house. Some of the finest pictures we have ever seen have been taken by the aid of very humble means. We are not satisfied that some glass houses which have been lauded are so fortunate as was anticipated; much depends on the experience of the operator. Mr. Mayall has consented to favour the Photographic Society with a paper on the subject, to commence the next Session. His great experience will render the communication very interesting and particularly valuable.

Letters of inquiry to the Editor can be answered only through the medium of Answers to Correspondents.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 147. JULY 15, 1864.

The Photographic Exhibition.

We must remind our readers that the Exhibition at 48 Pall Mall will close on Saturday, the 30th of July. With regret we announce that the Exhibition has not met with the success anticipated by its being held during what may be called the London season. Photographers have been so entirely occupied with their professional engagements that they have been unable to devote the short time even requisite for an inspection, and our amateur friends appear to have devoted their leisure during this favourable time in adding to their own portfolios. There cannot be a doubt also, that the exclusion of all coloured photographic miniatures has much diminished its value as an attractive Exhibition, to the general public. The Committee appointed for the carrying out all the arrangements, and the award of Prizes, have, after much consideration, made the following awards of Medals:—

Portraiture.—Mr. F. Joubert and Mr. T. R. Williams.

[*]*Landscape.*—Major Gresley.
Composition.—Lady Hawarden.
Architecture.—Withheld.
Photolithography.—Mr. Toovey.

The Committee have felt very great difficulty in making these selections, and in some instances it has not been unanimous.

There has been much to contend with in making selections in works respectively very excellent, and yet which will not, from the difference of the subjects treated, bear comparison for selection. In the case of Portraiture, the style of the works of each of the gentlemen who have been selected is so very excellent, and yet so distinct, that the Committee have felt themselves bound to present a Medal to each; and having withheld the award for Architecture, they feel more justified in doing so, as they have not thereby decreased the value of the distinction by an augmentation of the number of prizes bestowed.

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We have to notice, during the past month, the first application of a public Company to the extension of the Photographic art. We allude to the Photo-Sculpture Company, successfully inaugurated with a most influential directory, for the purpose of producing those beautiful works so much admired at one of our late meetings.

Another company, the United Association of Photography, has also just issued its prospectus in our advertising columns. This latter Company has embraced a much wider field of action, and is intended to develope any of the many branches of photography calculated to yield a fair return for skill and capital. The list of directors alone is an earnest of the position, ability, and influence of the Company; and, seeing how remunerative the business has been to the small capitalist, we cannot doubt the success of an enterprise where the accumulated knowledge of the past is backed by all the resources of capital.

◆

Photographic Society of Scotland.

The Exhibition of the Photographic Society of Scotland will be opened on the 1st December, when silver medals will be awarded for

The best view, taken by a dry process.
The best view, taken by an amateur, by any process.
The best view, in Scotland, taken by any process.
The best group.
The best portrait.

Conditions of exhibition and other particulars in future advertisements.

T. B. Johnston, *Hon. Sec.*
Edinburgh, 13th July, 1864.

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[*] Lieut.-Col. Stuart Wortley and Mr. Durham protest against the award of the Landscape Medal to Major Gresley. His picture of "Children in the Wood" is evidently touched, and his other pictures they consider surpassed by those of more than one other exhibitor.

H. P. Stuart Wortley, Lieut.-Col.
Joseph Durham.

On the Behaviour of Chloride, Bromide, and Iodide of Silver in the Light, and on the Theory of Photography. By HERMANN VOGEL.

Translated from Poggendorff's 'Annalen,' 1863, p. 497.

(Concluded from p. 62.)

A refutation of these views is no longer necessary, as Davanne has recently admitted that he was in error. The whole phenomenon is due to the circumstance that the film of albumen retains a certain quantity of silver (perhaps in the state of albuminate), and that this, by exposure, acquires the property of producing a picture with the developing fluid—a property which is destroyed or weakened by nitric acid (Photogr. Archiv, 1863, p. 73). On the other hand, Schnauss, Hardwich, Monckhoven, and others regard the change of iodide of silver as a purely physical one.

It is remarkable that in the collodion process the sensitive substance employed is not a film of chloride of silver, which undergoes the strongest *visible* and chemical changes by exposure to light, but a film of iodide of silver, which, as already indicated, experiences the least alteration of colour and no chemical change, or a mixture of iodide and bromide of silver. Why do not photographers employ pure bromide and chloride of silver, but only iodide of silver, as the sensitive film? For the solution of this question, it is necessary, in the first place, to test the photographic behaviour of each of the haloid salts of silver by itself. Before describing my own experiments, I will cite the most important statements of former investigators.

Soon after the publication of Daguerre's process for producing a picture on iodized silver plates, after exposure, by means of vapour of mercury, Claudet*, Gaudin†, and Moser‡ found that a silver plate which had been treated with chloride and bromide of iodine was considerably more sensitive to light than a merely iodized silver plate, that is to say, it developed a picture in the developer after a much shorter exposure to the light.

Schnauss says (Dingler's Journal, p. 146) that iodides retain the impression of the light very tenaciously, and become much blackened in the developer; bromides, on the contrary, are but weak. Others thought that bromide of silver was particularly sensitive to *green* rays (Hardwich, Manual, p. 87; Barreswille and Davanne, Chimie Photographique, p. 413). Schrank found by experiment (Photograph. Archiv, 1851, p. 61), using a green model, that a collodion film with bromide of silver is much less sensitive than one with iodide of silver, and that even the mixture of iodide and bromide of silver shows less sensitivity than iodide of silver alone.

With regard to the mixture of bromide and iodide of silver, Hardwich asserts that under certain circumstances the addition of bromide to iodide of silver may diminish its sensitivity, namely, when a weak silver bath is used, with pyrogallic acid as a developer, but that it has no diminishing action with a strong silver bath and a solution of iron as a developer. Moreover, the pictures are said to be clearer and free from spots (Hardwich, Manual, p. 148).

Sutton says that bromides increase the sensitivity when no organic salts are present in the developer, but otherwise they diminish it (Photogr. Archiv, 1861, p. 32). Liesegang also states (Photogr. Archiv, 1861, p. 161) that the different results which have been furnished by iodide of silver in conjunction with bromide are due to differences in the nature of the developer.

When developed with sulphate of iron, bromo-iodide of silver proves to be decidedly more sensitive, but not with pyrogallic acid; and with preparations not perfectly pure, bromo-iodide of silver gives pictures much freer from faults, reproduces the half-tints more distinctly, and prevents the so-called solarization.

From these historical notes it appears that but few experiments have been made with pure haloid salts of silver, and especially with the bromide and chloride.

I undertook a number of experiments to determine the behaviour of pure haloid salts of silver, after insolation, towards developing-agents. For this purpose I prepared a quantity of sheets of paper soaked with the above-mentioned substances, by floating clean photographic paper for two minutes upon solutions of 10 parts of iodide and bromide of potassium and 5 parts of chloride of sodium in 100 parts of water, and then hanging it up to drip and dry. (The above proportions of KI, K Br, and Na Cl nearly correspond with their equivalents.) The papers thus prepared were then floated by the light of a dull gas-lamp for two minutes upon a solution of 8 parts of nitrate of silver in 100 parts of water, hung up to drip, and finally thrown into a large dish with water. From the first dish they passed into a second, then into a third, and so on until the washing-water no longer gave a reaction of free silver. The papers were then again hung up to drip, and, lastly, dried by means of heat and bibulous paper.

In order to investigate the change which might possibly be undergone by the paper in the silver solution, a piece of clean paper was submitted to the same treatment in the silver solution as the above-mentioned prepared papers.

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* Journal of the Photographic Society, May 1861.

† Comptes Rendus, Oct. 18, 1841.

‡ Poggendorff's 'Annalen,' xlvi. p. 200. Moser says, ten times as sensitive.

The paper with chloride of silver appeared pure white, that with bromide pale yellow, that with iodine dark yellow, and the clean paper white. They were all preserved in the dark room in closed pasteboard boxes, which were themselves placed in wooden boxes. They kept well for 3 or 4 weeks, but afterwards showed by a slight coloration that, notwithstanding all the precautions taken, a trace of light had penetrated to them, and produced in the course of weeks the same change as strong light in a few seconds.

Small strips were then cut from the papers and stuck, for the purpose of testing their behaviour towards light, into a book; they were then exposed to the light, and drawn out at intervals of one or more minutes or seconds. After the termination of the exposure, they were carried back into the dark room, moistened with water, and treated with the developer.

The developer consisted of a solution of 1 gr. of pyrogallic acid and 1 gr. of citric acid in 250 parts of water. To 5 cubic centimetres of this 4 drops of a solution containing 5 per cent. of nitrate of silver were added, and this mixture was poured over the papers. (Sulphate of iron is not applicable as a developer to paper.) The only object of the addition of citric acid is to retard the reduction of the silver-salt by the pyrogallic acid.

If pure pyrogallic acid be mixed with a solution of silver, a precipitate of granularly pulverulent silver is almost immediately produced, mixed with a black substance which may be extracted by ammonia. A precipitate produced thus instantaneously, however, is deposited not only on the spots which have been acted upon by light, but also on those which have not been affected. It is otherwise when an acid is added: the precipitate is then lighter, that is to say, purer; it makes its appearance more slowly, and deposits itself first upon the spots acted upon by light; and it is only afterwards, when the decomposition is approaching its termination, that parts not acted upon are slightly coloured. It is, however, easy to remove the developer before this point is reached, and thus to obtain the proper result.

After development, I allowed a stream of water to flow over the papers, washed them out, compared their coloration by lamplight, and fixed them with hyposulphite of soda when it seemed to be necessary.

First experiment.—Strips of each of the papers, including that immersed only in the nitrate of silver, all half covered, were exposed for one minute in diffused daylight. The iodide paper became slightly grey, the bromide paper pale greyish violet, and the chloride paper pale violet. All the papers were then treated with the developer. The exposed parts immediately became darker—most rapidly in the case of the iodide, later with the bromide and chloride. The coloration gradually increased, producing with the iodide a deep blackish-grey, with the bromide a slighter brownish-grey, and with the chloride a pale yellowish-brown tint. The plain paper was perceptibly coloured, although very slightly, on the exposed part. If the plain paper be exposed to the light for *several minutes*, it becomes brownish—a proof that, notwithstanding the washing, it has retained a trace of silver.

Second experiment.—The same experiment was repeated, but pyrogallic acid without silver-solution was poured upon the papers; by this means they acquired no colour even when the action was continued for some minutes.

From these two experiments it follows—

1. That pyrogallic acid alone does not alter insolated paper with iodide, bromide, and chloride of silver.

2. That those haloid salts acquire, by exposure to the light, the property of attracting and retaining nascent granularly pulverulent silver.

3. And that paper which has been immersed in solution of silver retains a trace of silver even after long washing, acquires a brown colour by exposure, and behaves with the developer in the same way as exposed chloride, bromide, and iodide of silver.

I now endeavoured to compare more accurately the intensity of coloration acquired by the above-mentioned papers in the developer after equal insolation, but found, from repeated experiments, that the results were not always exactly alike. I soon noticed that a want of uniformity in the preparation was the cause of this. About this time appeared the work of Bunsen and Roscoe (Photochemische Untersuchungen, Pogg. Ann. cxvii. p. 529), in which Bunsen states that, in order to prepare a uniformly sensitive chloride paper, the paper must be completely immersed in the solution of the metallic chloride. In accordance with this, I prepared a new series of papers, immersing them completely in the solution of chloride of sodium and iodide and bromide of potassium, and also afterwards in the silver-solution, but treating them in other respects exactly as above described. The papers thus obtained gave concordant results.

Three such papers were stuck into a book, with their ends projecting; the book was then put into a pasteboard box, and carried into diffused light. The box was then opened, and the papers drawn out at intervals of half a minute; the exposure was continued thus for two minutes, and then the whole was carried back into the dark room. The iodide of silver was pale grey, the bromide pale greyish violet, and the chloride pale violet. With the chloride and bromide the coloration was deeper in proportion to the duration of the exposure. With iodide of silver the portions exposed for more than one minute did not appear more deeply coloured than those exposed only for one minute, but the latter were somewhat darker than those exposed for half a minute. When treated with the developer, the iodide was coloured most rapidly, next the bromide, and later still the chloride.

At first, differences appeared in the coloration of the individual portions which were exposed for different periods to the light, but these very soon disappeared with the bromide and iodide; they then acquired a pretty uniform coloration on the portions exposed for more than one minute, but a somewhat weaker one on those exposed only half a minute. The iodide became blackish grey, the bromide light brownish grey. The chloride paper only acquired a slight yellowish-brown colour, which became more and more intense the longer the time of exposure.

It is to be observed that the chloride and iodide acquired some colour even on the unexposed portions, the former becoming slightly yellowish, and the latter slightly grey; the bromide, on the contrary, remained uncoloured on the unexposed portions.

From these experiments, which were repeated five times with the same results, it follows that,

Of the three silver-salts after exposure to the light under precisely the same conditions, the iodide becomes most intensely and the chloride most faintly coloured in the developer.

This result is certainly remarkable. It is exactly that silver-salt which, *when alone*, undergoes the most intense alteration of colour and chemical change by exposure to light, namely the chloride, that acquires the weakest coloration with the developer; whilst the iodide, which undergoes the least visible change and no perceptible chemical alteration when exposed by itself to the light, acquires the most intense colour with the developer. From this it follows, as will be confirmed by the following investigations, that the changes effected by light, which render these bodies capable of attracting particles of silver, are not parallel to the chemical changes, and are therefore something different from them.

I must therefore assume that there is another action of the sunlight besides the chemical one. To this action of light, which makes iodide of silver and other bodies attract and retain granularly pulverulent silver, I give the name of *graphic action*. I give the name of *photographic sensitivity* to the faculty possessed by certain bodies, after insolation, of attracting granularly pulverulent silver and also other bodies, for example, particles of mercury in the daguerreotype process; and that of *photographic coloration* to the dark colour which they acquire in the developer.

In opposition to these I place the *chemical action* of light, that is, the tendency to chemical decomposition or combination produced by light.

The *photochemical sensitivity* is the faculty possessed by certain compounds of being chemically decomposed in the light of the sun.

The *photochemical coloration* is the change of colour which they at the same time undergo.

I may consequently put the above statement thus:—*Iodide of silver is photographically most sensitive, chloride of silver least sensitive, and the bromide occupies the middle place.*

I now pass to the description of the *photographic* behaviour of the haloid salts of silver in the presence of other bodies. Upon the influence of these we have already many observations. From the practice of photography we know that acids diminish the sensitivity of photographic plates, and that moist plates with adherent silver-solution are much more sensitive than those from which the silver-solution has been washed away. The actions of such bodies upon the different constituents of photographic plates, that is, upon iodide and bromide of silver *alone*, have, however, hitherto been but imperfectly investigated, and I have therefore undertaken the following series of experiments.

1. *Influence of Water.*—Pieces of paper prepared with chloride, bromide, and iodide of silver were half wetted with distilled water and wiped with blotting-paper; they were then, whilst still moist, exposed for one minute and treated with the developer. *The moist and dry parts of the different papers exhibited nearly the same photographic behaviour.*

2. *Influence of Acids.*—In the experiments previously described it was proved that acids exerted an influence upon the *photochemical coloration* of bromide and iodide of silver, and also that those salts when coloured by light were entirely or partially bleached by acids. The influence of acids upon the photographic properties of the salts is still more striking.

Papers with bromide and iodide of silver were partially moistened with nitric acid of sp. grav. 1·2, and exposed for five minutes in diffused light; the acid was then washed off in the dark, and the papers put for five minutes into a large vessel of water and afterwards developed. Even before the development the lighter colour of the portions moistened with nitric acid was perceptible, and in the developer those spots acquired no colour, whilst the rest became deep blackish grey or brownish grey.

The same experiment was made with dilute sulphuric acid and with acetic acid. It was found that the parts thus moistened acquired less colour in the developer than the other parts. *Consequently acids destroy or weaken the photographic sensitivity.*

Acids act in the same way *after* as well as *during* the exposure. Two strips of paper with bromide and iodide of silver were exposed for a minute and a half, partially moistened in the dark with nitric acid of spec. grav. 1·2, left for five minutes, and then washed with water and developed. The portions moistened with acid were *quite indifferent*, whilst the rest became much darkened; consequently nitric acid destroys the impression produced by the light upon the bromide and iodide of silver. This behaviour again shows distinctly the difference between the chemical and graphic action of light; the former cannot be done away with by nitric acid, whilst the latter is completely destroyed by it.

The same experiment was made with dilute sulphuric acid ($1\,SO^3$, $5\,HO$) and with acetic acid. In these cases the portions moistened with acid become coloured later and more faintly than the rest. The action of acetic acid was weaker than that of sulphuric acid.

The retarding action of acids is consequently much more strongly manifested in the case of photographic than in that of photochemical coloration. Norris has also observed the destruction by acids of the impression made by light upon iodide of silver (Hardwich, Manual, p. 52).

As I have already established that during the action of acids upon bromide and iodide of silver no solution of silver takes place, I must conclude that the whole is merely an action of contact.

In photographic processes, however, the action of acid is to be looked on in another point of view, namely, as retarding not only the action of light in the camera, but also the reduction of silver by the developer; for this reason acid is added to the latter in order to enable the reduction to be regulated. This acid, however, will have an injurious action even after exposure, inasmuch as it partially does away with the change effected by light. Hence it is advisable to reduce the quantity of acid to a minimum.

3. *Action of Iodide of Potassium.*—I have demonstrated that in the presence of iodide of potassium, AgI^{β} becomes pale yellow and indifferent to light, and also that the grey coloration of AgI^{β} produced by light is removed again by iodide of potassium. The behaviour of iodide of potassium with regard to the photographic properties is still more characteristic. (Only iodide of silver can be employed in these experiments, as the bromide and chloride are immediately decomposed and furnish iodide of silver, with iodide of potassium.) Two pieces of paper with iodide of silver were moistened with fresh solution of iodide of potassium, and exposed to light. The moistened parts remained pale yellow, whilst the rest acquired a yellowish-grey colour. The papers were then washed with water and developed in the dark. The parts moistened with iodide of potassium continued perfectly colourless or yellow, whilst the rest became deep blackish grey.

Two papers, after exposure, were treated with solution of iodide of potassium, left for two minutes, and then carefully washed. The portions moistened with iodide of potassium appeared decidedly paler even before development; when developed they scarcely acquired any colour, but at length became covered with a pale grey veil, while the parts not moistened with iodide of potassium became very dark. Consequently *iodide of potassium has a destructive action upon the impression caused by light, both during and after exposure.*

Schnauss's results (Photogr. Archiv, 1860, p. 115) seem to contradict the last statement. He found that a *moist* photographic plate, washed with water *after* exposure, and then treated with solution of iodide of potassium and again washed, still developed a picture. This circumstance may perhaps be explained by Schnauss not having experimented with pure iodide of silver, but with iodide in contact with nitrate of silver.

Action of Nitrate of Silver.—In the first part of this memoir it was shown that the haloid silver-salts, and especially the bromide and iodide, acquire a much darker colour when exposed beneath solution of nitrate of silver than by themselves. In a similar manner nitrate of silver heightens the photographic sensitivity.

For the demonstration of this action, papers with chloride, bromide, and iodide of silver and clean paper were partially moistened with nitrate of silver ($1\,AgO, NO^5, 10\,HO$) and exposed for from one to five minutes. A deeper coloration of the parts moistened with nitrate of silver was soon observed. All the papers were thrown into water, left therein for eight minutes, and then washed and developed; *in all, the parts moistened with nitrate of silver acquired colour more rapidly and intensely than the rest.*

In order to ascertain which of the papers had its photographic properties most heightened by solution of nitrate of silver, these papers, after being moistened with nitrate of silver, were simultaneously brought into the light, exposed for equal periods (½ to 2 minutes), washed, and simultaneously developed. The coloration of the spots moistened with nitrate of silver in the clear sunlight agreed with that already observed. The most intense coloration was that of the bromide, the weakest [among the haloid salts] that of the chloride; the coloration of the clean paper with nitrate of silver was still weaker. In the developer, however, the iodide acquired the deepest colour, and became greyish black; the colour of the bromide was rather less deep (only blackish brown); that of the chloride was still weaker, and that of the clean paper weakest of all. Hence, when in contact with nitrate of silver, iodide of silver is most strongly affected, next to this the bromide, and least of all the chloride. These bodies therefore behave, when in contact with nitrate of silver, exactly as in the pure state.

From the greater sensitivity of iodide of silver in the presence of nitrate of silver, it has been inferred that pure iodide of silver is quite indifferent to light, and is indebted for its sensitivity to a trace of nitrate, which cannot be got rid of even by long washing. Sutton (Photogr. Archiv, 1862, p. 188) especially has warmly defended this view. He starts from the fact that iodide of silver precipitated from an excess of solution of iodide of potassium is indifferent to light. He thinks it improbable that a trace of retained iodide of potassium can be the cause of this indifference, and that he must therefore assume that iodide of silver is not in itself decomposable in the light, but only favours very energetically the decomposition of other decomposable silver-salts which may be in contact with it. He consequently attributes to the iodide of silver only the office of a mere substance of contact (*Contactsubstanz*; catalytic substance).

To explain the sensitiveness of washed iodide of silver, he assumes it to retain a trace of nitrate of silver, which alone is sensitive to light, and the sensitivity of which is only assisted by the presence of the iodide of silver. His argument here is inconsequential. He resists the assumption that a trace of iodide of potassium mixed with the iodide of silver can have any action, and then ascribes an essential action to the trace of silver-salt which is supposed to remain in the iodide. But he goes still further. In order to explain the sensitivity of daguerreotype plates, in the preparation of which only metallic silver and vapours of iodine or bromine and iodine are employed, he assumes that in the cleaning of these a trace of oxide of silver is produced on the surface, and that this forms the true sensitive body. This rather bold assertion is supported by no experimental proof, and therefore I do not consider it necessary to contradict it. In the same way he explains the greater sensitivity often ascribed to a mixture of iodide and bromide of silver from the action of contact which is exerted by iodide of silver upon all the salts of silver which are decomposable by light, and even says that in their decomposition metallic silver is set free. That the last supposition is erroneous I have already proved. I cannot see why he should assume that metallic silver is set free during the process of insolation. He does not say that it is necessary for the production of the picture, as has been positively asserted by Davanne. Schnauss and Monckhoven (Photogr. Archiv, 1862, p. 188) also regard the presence of a trace of free nitrate as necessary. I did not think it improbable that iodide of silver actually retains a trace of silver; and I have already positively demonstrated that the paper which bears the iodide retains some nitrate of silver. I therefore at first believed that this trace of nitrate might have some essential action.

When iodide of silver is exposed to light in contact with nitrate of silver, silver is set free. These silver particles thus set free attract, as I suppose, silver from the developer, and thus cause the appearance of the picture. The favourable action of the excess of nitrate present would therefore be easily explained from the increased separation of silver caused by it; the preventive action of acids by the retardation of the reduction; and the destruction by acids of the photographic properties of insolated iodide of silver by the solution of the silver particles reduced by the action of light. In short, the whole cycle of phenomena here described would be easy of explanation from the point of view just indicated. Nevertheless this point of view is not tenable, inasmuch as it is in contradiction to the following facts:—

1. It does not explain the acquisition of a pale yellow colour by iodide of silver which has become grey by exposure, and the concurrent destruction of sensitivity produced by iodide of potassium; for metallic silver, even when finely divided, is not affected by iodide of potassium.

2. The bleaching action exerted by nitric acid upon insolated bromide and iodide of silver, and the concurrent destruction of their photographic action, cannot be due to a solution of particles of metallic silver adhering to the iodide; for the nitric acid does not afterwards give a reaction of silver.

3. The following experiment proves most convincingly that the presence of nitrate of silver in the iodide is not the cause of the sensitiveness of the latter.

I cut two strips of iodide-of-silver paper and laid them in the dark in a solution containing five per cent. of common salt; they remained in this for an hour. The colour of the papers was not in the least changed. They were then washed and left lying in water, and finally exposed and developed simultaneously with a moist iodide-of-silver paper which had not been treated with solution of chloride of sodium. If even a trace of nitrate of silver had been present in the iodide of silver, this must evidently have been destroyed by the action of the chloride of sodium and converted into chloride of silver; and if the presence of nitrate of silver be the essential cause of the sensitivity of the iodide, this must have been either weak or entirely wanting in the papers treated with chloride of sodium. With the developer, however, both papers were blackened with equal rapidity, and the paper treated with chloride of sodium even a little more intensely than the other. This experiment, repeated several times with the same results, sufficiently proves that a trace of nitrate in iodide of silver is not the cause of its sensitiveness.

I now pass, in conclusion, to the behaviour of mixtures of the haloid salts of silver. The data furnished by other investigators upon this subject have been mentioned above. My own researches relate to

The Behaviour of Mixtures of Iodide and Bromide of Silver.

I have already shown that bromide of silver by itself is photographically weaker than iodide of silver by itself. In order to ascertain how a mixture of the bodies would behave, I mixed solutions containing 10 per cent. of iodide and bromide of silver, in the proportion of two parts of the former to one of the latter, prepared papers in the mixture, and sensitized them in the same way as above described for the preparation of papers with iodide and bromide of silver alone.

Strips of the paper thus prepared were exposed simultaneously with others with iodide of silver, and developed with pyrogallic acid. From eight concordant experiments it appeared that the bromo-iodized papers became coloured more rapidly and rather more deeply than merely iodized papers.

Bromo-iodized paper was also more strongly affected when in contact with silver solution than simply iodized paper moistened with the same solution.

These experiments prove that a mixture of bromide and iodide of silver is more sensitive to light than pure iodide of silver, even when pyrogallic acid is employed as a developer (in opposition to the opinions of Sutton and Liesegang).

I cannot yet give any explanation of this peculiar influence; but, considering that nitrate of silver assists the sensitivity, that even the strip of iodized paper which had been immersed in chloride of sodium and which contained a trace of chloride of silver (formed by the action of the chloride of sodium upon a trace of retained nitrate of silver) showed a somewhat increased sensitivity, the preparation of daguerreotype plates with chloride of iodine (Moser), and, lastly, that bromide of silver mixed with iodide exalts the sensitivity, I think *that all silver-salts chemically decomposable by light, when mixed with iodide of silver, are capable of increasing the sensitivity of the latter.*

I have now to speak of a series of remarkable phenomena, which have been long observed both upon daguerreotype and photographic plates, and which are comprised under the title of

Phenomena of Solarization.—According to Moser (Pogg. Ann. lvi. p. 217), when an iodized silver plate is exposed for a short time in the camera and then to mercurial vapours, the latter are deposited upon the insolated spots, and a positive picture is obtained corresponding with the original in its lights and shades; but if the plate be allowed to remain longer in the camera, the mercurial vapours produce a negative picture, in which the light parts of the original appear dark, and the dark parts light. "Consequently," says Moser, "when light acts upon iodide of silver, it communicates to it in increasing proportion the modification enabling it to condense mercurial vapours; but if it acts beyond a certain time, it deprives it of this modification again."

This singular phenomenon has been described under the name of "solarization," and similar observations have been made upon collodion in practical photography. It has been noticed that, up to a certain point, the negative plates become blackened in the developer proportionally to the intensity of the light; but that parts of the plate which have been too strongly illuminated do not acquire a deep blackening in the developer, but remain yellowish red and transparent. For the closer examination of these remarkable phenomena, I made the following experiments:—

1. Two strips of iodide-of-silver paper were fixed in a book and exposed to direct sunlight for two hours, when they were drawn out a little, and again in one hour; after half a minute longer exposure, the whole was carried into the dark closet. The different portions of the papers were therefore exposed for three hours, one hour, and half a minute. In the developer, the portions exposed for half a minute became darkest; the portion exposed for an hour was lighter, and that exposed for two hours lighter still. Hence, according to this experiment, the maximum of photographic action was attained in half a minute.

The same experiment was at the same time made with bromide of silver, and with this also it proved that the maximum of photographic action occurred within half a minute's exposure.

The duration of the exposure was then limited to shorter intervals. I prepared two very carefully planed boards, and pasted paper on them, forming a fold round one of them. Upon the lower horizontal board I fastened down the strips of paper with iodide and bromide of silver, &c., side by side, covered them with the other board, and then brought the whole into the light. The upper board was then pushed off sideways, half an inch at a time, so as to expose successive portions of the papers to the action of light.

I first fastened down a strip of iodized and a strip of bromized paper parallel to each other, and pushed off the covering-board (in the diffused light of the blue sky, at 10 o'clock in the morning of the 10th April) at intervals of 5, 5, 5, 2, 2, 1, $\frac{1}{2}$, $\frac{1}{4}$, minutes. The iodide of silver became grey, and the bromide of silver pale violet; the grey colour of the former increased during the intervals of $\frac{1}{4}$, $\frac{1}{2}$, 1 minute, but afterwards remained the same; with the bromide, on the contrary, the chemical coloration increased in proportion to the time of the exposure. The reverse was the case in the developer; in both papers the parts exposed for a quarter of a minute acquired the strongest colour, and all the rest were weaker the longer they had been exposed.

From this experiment, it appears that the chemical and photographic colorations are not parallel; for the former is proportional to the time of exposure, whilst the latter showed itself most intensely upon the portion which had been illuminated for the shortest time.

In a second experiment of the same kind, in which I exposed the papers to the diffused light of the clear-blue sky for intervals of 15, 10, 5, 5, 2, 1, seconds, so that the portions gradually exposed were illuminated for 38, 23, 13, 8, 3, and 1 seconds, I found that the photographic coloration increased from 1 to 13 seconds, remained nearly the same in the following interval, and then again diminished; and this was the case both with bromide and iodide of silver. Here, therefore, the maximum of action occurs between 10 and 23 seconds. On the same day I made a second experiment at noon, when the maximum of effect occurred even in 10 seconds. During exposure in a moderately light room, the maximum was only attained in 1 minute.

On another (likewise bright) day, I found the maximum both with bromide and iodide of silver at 10 seconds, thence to 20 seconds the coloration remained nearly the same, and then it gradually diminished.

In a subsequent experiment the strips were exposed at intervals of 1, 1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, and $\frac{1}{12}$ minute. In this case the coloration attained its maximum in the second interval (15 seconds exposure), after which it gradually diminished.

In the afternoon of the same day, an experiment was made at intervals of 2, 1, $\frac{1}{6}$, $\frac{1}{6}$, $\frac{1}{6}$, $\frac{1}{6}$, $\frac{1}{6}$, minutes. The maximum of photographic coloration occurred in 40 seconds; it remained the same up to 50 seconds, and then a gradual diminution took place. This experiment shows how the time within which the maximum of coloration is attained varies according to the strength of the light.

The discrimination of this maximum is, however, attended with great difficulties. The eye is indeed capable of detecting small differences of intensity in pale colours, but not in intense ones (Bunsen); for this reason the intervals must not be made too short. I therefore tried leaving the papers for a short time only in the developer, until they were faintly coated. But this did not answer the purpose; for at first they usually became coloured proportionally to the time of exposure, and the above-mentioned differences of coloration only made their appearance subsequently; the chemical coloration, proportional to the illumination, acquired by the bromide paper, was also somewhat injurious to the result; and possibly some influence may be ascribed to the paper, which is likewise a little blackened in the developer, and indeed the more intensely the more strongly it has been illuminated*.

From these experiments, it appears to be quite certain—

1. That the graphic action of light quickly attains a maximum within a certain time, vary-

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* In the fixing-bath all these strips lose a little of their intensity; this is especially the case with the bromide paper.

ing with the strength of the light, and then gradually diminishes. To the point at which bromide and iodide of silver attain the faculty of blackening in the highest degree, I will give the name of the *photographic maximum.*

2. That iodide and bromide of silver are parallel in their behaviour towards light, that is to say, under otherwise similar conditions they increase and diminish in their photographic properties in the same intervals of time. From this we may with great probability draw the conclusion—

3. That the photographic maximum of both is attained in the same time under otherwise similar circumstances.

That the graphic action increases rapidly, and diminishes much more slowly, is very fortunate for the practice of photography; for frequently, in taking objects illuminated with very different intensities, the lightest parts of the picture have already attained the maximum when the darkest parts have only begun to act, and if, in this case, the action did not continue, at least for a short time, nearly at the maximum, it would be almost impossible to reproduce the lights and shadows with truth.

With regard to chloride of silver, I have only made a few experiments. A strip of paper with chloride of silver was exposed to direct sunlight for intervals of 1, 1, 1, ½, ½, ¼ minute; the different portions acquired a violet colour in proportion to the length of exposure. In the developer, the colour at first increased in proportion to the time of illumination, but, by longer action, the portion exposed for ¼ minute became most intensely coloured. Several experiments of the same kind were made with a similar result; so that the phenomenon of solarization is ascertained to take place with chloride of silver also. But as chloride of silver does not acquire much colour in the developer, and both the violet coloration attained by it in the sun's light and the photographic sensitivity of the paper become important sources of disturbance with it, the phenomenon cannot be so well observed here as with bromide and iodide of silver.

It appears, however, that in this case also the maximum of graphic action is produced in nearly the same time as with iodide and bromide of silver. More accurate experiments made with a more sensitive developer, and with the assistance of a good photometer, must furnish more precise results upon this point. The above experiments have, however, shown at least that the time in which the photographic maximum is attained depends upon the strength of the light, and I consider myself justified in asserting *that the product of the intensity of light and time in respect of the photographic maximum is unalterable* with regard to both iodide and bromide of silver (and probably also to chloride).

The phenomenon of solarization is of the greatest interest for the theory of photography. As I have already said, the chemical action of light upon bromide of silver requires several minutes before it becomes perceptible by iodized starch paper. But before this result is attained, the photographic maximum is exceeded. This is the most positive proof that the photochemical action is essentially different from the photographic.

I can give no explanation of the phenomenon of solarization. Schnauss thinks that by the long action of light an actual chemical decomposition of the iodide of silver is induced, and thus its property of attracting particles of silver is destroyed. I have, however, ascertained that there is no chemical decomposition of the iodide in this case. And even with the bromide this would be no explanation, but only a paraphrase of the fact.

If the proposition above enunciated by me be correct, a strip of paper with iodide or bromide of silver may serve at any time by a simple experiment to determine the chemical intensity of light.

The following statements constitute a summary of the results obtained by me:—

1. Light communicates to iodide, bromide, and chloride of silver the faculty of attracting and retaining nascent particles of silver.

2. Under otherwise similar circumstances, iodide of silver acquires this faculty in the highest degree, then follows bromide, and afterwards chloride of silver. Insolated iodide of silver acquires a blackish-grey colour in the developer, bromide a brownish grey, and chloride a pale brownish yellow.

3. This action of light stands in no relation to its chemical action, for

a. It shows itself at a maximum in that salt (Ag I) which undergoes no appreciable chemical change, and at a minimum in that (Ag Cl) which is most strongly chemically decomposed.

b. In the case of the chemically decomposable bromide of silver, the graphic action of light has already exceeded its maximum and become diminished before the chemical action is appreciable (by iodized starch paper).

Moreover with chloride and bromide of silver the chemical coloration does not run parallel with the photographic, for the former continues increasing when the latter has long exceeded its maximum and begun diminishing.

4. Clean paper, soaked in nitrate of silver

and carefully washed, retains a trace of silver-salt, acquires a brownish colour in the light, and is then feebly sensitive photographically, that is to say, it is slightly coloured by the developer.

5. Nitrate of silver assists the photographic sensitivity of chloride, bromide, and iodide of silver. The relative photographic sensitiveness of the three salts, however, remains the same, that is to say, the iodide is the most sensitive, and the chloride the least so. (The photochemical sensitivity, that is, the faculty of becoming blackened in the sun's light, in contact with nitrate of silver, is greatest in the bromide.)

6. Moisture has no perceptible influence on the photographic sensitivity of the pure haloid salts of silver.

7. Acids diminish or destroy this sensitivity in iodide and bromide of silver both during and after exposure to light: nitric acid is most energetic, and acetic acid weakest, in its action.

8. Iodide of potassium completely destroys the photographic sensitivity of iodide of silver, both during and after exposure.

9. Mixtures of bromide and iodide of silver are photographically more sensitive than pure iodide of silver, that is to say, that under perfectly similar circumstances (equal exposure and similar mode of development) they become more intensely blackened in the developer than pure iodide of silver. Mixtures of chloride and iodide of silver behave in a similar manner. (Indeed all silver salts which are chemically decomposable by light appear, when mixed with iodide of silver, to exalt its photographic sensitivity.)

10. The graphic action of light upon the haloid salts of silver increases rapidly up to a certain point, and then diminishes slowly (solarization).

11. This increase and diminution takes place simultaneously with iodide and bromide of silver; from this I conclude that in both the maximum of photographic action occurs at the same time.

12. The time within which light exerts the maximum of its graphic action depends upon the intensity of the light. The more intense the light, the shorter the time.

I therefore regard it as highly probable that, for the attainment of the photographic maximum, a perfectly definite and always uniform product of intensity of light and time is necessary.

During the preparation of this memoir I met, in the April Number of the 'Photographische Archiv' for the present year, with a paper by Monckhoven on the "Theory of the Photographic Process," from which I see that he has occupied himself with the same subject as myself. It is with particular pleasure that I find, in the work of so noted an investigator in the field of photography, a confirmation of my results.

Monckhoven refutes Davanne's assertion that iodide of silver is decomposed by light into Ag and I (a notion which Davanne himself has lately given up), and maintains the opinion that iodide of silver when exposed to the sun's light only undergoes a physical change, founding his views on the phenomena of solarization. (He has made no chemical investigations in connexion with this.)

He likewise ascribes the production of pictures by means of chloride and bromide of silver, or of iodide of silver in contact with silver-solution, solely to a physical action of light, but without mentioning the chemical changes which take place at the same time, and also states that each of these bodies possesses the property of solarization. Upon this point he has no more detailed statements.

I hope that, in my investigations described above, I have thrown light upon many points which Monckhoven has left untouched, although I feel that my attempts are still imperfect and that the theme is still unexhausted. For the present, however, not to extend this memoir to a great length, I must break off, and leave the publication of my other researches for some future time.

The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors.

No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith. The same proviso extends to communications to the Editor.

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Rival Tents.

MANSION-HOUSE.—Mr. James How, of 2 Foster-lane, City, attended before Mr. Alderman STONE on a summons charging him with having unlawfully applied a new and original design of a certain article of manufacture having reference to a purpose of utility to a certain other article of manufacture, without license or consent.

Mr. Bowen May, solicitor to the Association for the Protection of Copyright in Engravings, and also to the Association of Photographers for the Protection of Copyright, conducted the examination. Mr. Webster, Q.C., appeared for the defence.

The complainant was Mr. William White Rouch, of 180 Strand, manufacturing chemist. He said he had of late years devoted much of his time and attention to photography. On the 12th of August, 1861, he registered a design for a portable operating-chamber or tent, the object of which was with the least possible trouble and expense to carry on scientific experiments in photography, and which design he now charged the defendant with pirating. He had since employed a man named Wright in making tents after the design so registered. His design was shown at the Exhibition of 1862, and was much admired. It had cost him a great deal of time and trouble, and he believed it to be the best that had yet been made. The defendant's tent resembled his in general configuration, the principal difference being that the roof was of wood, while his was of iron.

In cross-examination by Mr. Webster he said his attention had been applied to the subject for about ten years. He had registered a design for an apparatus for a similar purpose in April 1859, but in practice he found it inconvenient in many respects, and had sought to remedy its shortcomings by the subsequent design. The new one was wholly different in construction, and very much more simple. The registration in both cases was for three years, and it cost him about £10 10*s*. in each. He had not thought it desirable to patent either of them. A patent might have cost him £50; but in registering the design, instead of patenting it, he had no intention of "doing" the revenue.

William Wright deposed that he worked for the complainant, and that in March last he called upon the defendant at his request. The defendant, who was a stranger to him, showed him the design of a photographic tent which he said he was about to bring out. Witness told him it resembled Mr. Rouch's very much. He replied he had never seen Mr. Rouch's, and that he had got the first idea of his own tent from the act of putting a letter into an envelope. At his request witness made him a tent after a pattern the defendant gave him. When made it was similar to that of Mr. Rouch, different only or chiefly in that it had in the cover what a dressmaker would call a "gore." Witness added, in cross-examination, that he offered to make the defendant as many tents as he wanted, but he only made him one.

Mr. Webster, for the defence, did not deny that Mr. Rouch had invented a very useful article, but he contended that the tent of the defendant was much more useful and popular. This, however, was a question of design. The object of the Registration of Designs Act was to protect designers with reference to things that depended on shape and configuration, and such as could be drawn on a flat surface for purposes of ornamentation, as a pattern for a lady's dress or a carpet. The amended Act had for its object to protect new and original designs for any article of manufacture having reference to some purpose of utility, so far as such design should be for the shape or configuration. He did not deny that the complainant could register the shape of his box; but that he did in 1859, and on the expiration of three years after registration it was open to all the world to copy it. He contended that the design of the complainant's tent, registered in August 1861, was in no respect new or original, but only a combination of parts of the previous one, and that according to the decision in the "Queen v. Bessell" he had no just cause of complaint.

The Alderman intimated that he was prepared to decide the case upon its merits; but eventually the summons was withdrawn, on the election of the complainant's solicitor, in order that the question might be raised in a superior court.

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Fry v. *Bernstingl.*

An action brought to recover the balance due for photographic negatives, and which has been repeatedly before the court, was decided on the 28th ult. Three years ago the defendant contracted with the plaintiff to pay him fifty guineas for fifty instantaneous negatives to produce transparencies. Mr. Fry proceeded to take them, and delivered seventy to be selected from, receiving at the time £25 on account. Subsequently the defendant declined to make the selection, or to pay any more money, or return any part of the negatives. The action was tried before Mr. Justice Byles in the Court of Common Pleas,—Mr. Serjeant Parry and Mr. Day for the plaintiff, and Mr. Serjeant Petersdorff and Mr. Foard for the defendant. The defence was that the negatives were worthless. Messrs. Valentine Blanchard, Sydney Smyth, C. E. Elliot, and Dr. Diamond were called to speak to the quality of the negatives; and Mr. Caldesi, Mr. Shew, and one or two other witnesses were called for the defence to prove the negatives bad. A verdict was returned for the plaintiff for the balance due.

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Enlarged Positives on Artist's Canvas.

By Charles Waldack.

Select a very smooth piece of canvas, covered with a thick coating of white lead, old enough to have acquired a certain hardness. This canvas extended upon a square frame must be cleaned, so that an aqueous liquid will adhere to the entire surface, instead of in drops, as upon a greasy substance, or, in other terms, it must retain water. This result is obtained either by washing the surface with soap-water containing a small quantity of alkali or cyanide of potassium, or by rubbing it with a piece of rag moistened with alcohol.

This done, apply the following solution to its surface by means of a large flat brush or pencil:—

Distilled water	1000 parts.
Gelatine.................	15 ,,
Iodide of potassium	10 ,,
Bromide of potassium	5 ,,

The gelatine must be softened in water during one or two hours, after which the application of a gentle heat will cause it to dissolve.

This solution is applied warm: it becomes a jelly when cold. The canvas is covered with this solution in a room heated to such a temperature that the coating will become dry without first setting. We can easily perceive when this result is attained; for if the coating sets first, it dries irregularly, forming lines and veins.

The second operation is the sensitizing. It is effected by means of the following solution:—

Distilled water	1,000 parts.
Nitrate of silver..........	50 ,,
Iodide of potassium	0·6 ,,
Ordinary acetic acid	100 ,,

This solution is applied by making the canvas into a dish by turning up the edges, first removing it from the stretcher; it may also be fitted into a frame which will form a dish.

To sensitize the canvas raise the dish on one side, as in sensitizing collodion plates, and pour into the lower part a sufficient quantity of the nitrate-of-silver solution, then cause it to flow over the whole surface by making the dish resume its horizontal position. Let contact be prolonged for about a minute, keeping the frame constantly in motion, after which pour off the nitrate solution into a bottle. This solution must be employed only once, and care must be taken to employ only sufficient quantity to sensitize each canvas.

The focusing is made upon the canvas before sensitizing.

The exposure to light is effected by means of the solar camera: the time of exposure will depend upon so many different circumstances, that it is impossible to state it absolutely. In our practice it has varied from thirty seconds to five minutes. The picture is slightly visible before development, and the more so in proportion to the strength of contrast in the negative.

Development is performed with a solution, one-fourth saturated, of gallic acid, to which a few drops of acetic acid are added. It must be effected as rapidly as the iron development in the collodion process. The solution of nitrate, which during the exposure has drained into the lower part of the dish, is put into a bottle, then the developer is projected over the canvas, care being taken to cover it at a single dash. This is performed in the same manner as the sensitizing.

The solution of gallic acid must act like the pyrogallic in the collodion process. If it blackens rapidly, and before the picture has completely appeared, it shows that the silver solution contains organic matters, or that it has been in contact with the caoutchouc tube.

To avoid the whites becoming tarnished, by protracted developing, we stop the latter by pouring a very weak solution of common salt upon the picture. It is then washed in several waters, removed from the frame, and fixed by hyposulphite of soda, of the usual strength. The final washing to remove the hyposulphite may be performed in five or six minutes.

The picture must not be fixed while it is in the frame; for this must be washed with very great care, before being again employed.

The frame is cleaned with soap-water and a little cyanide of potassium, then washed in plenty of water.

The nitrate of silver employed blackens in the course of a few hours, and it is impossible to purify it by filtering through kaolin or chloride of silver. It is therefore best to precipitate the silver in the state of chloride, or evaporate the solution to dryness, and heat it to destroy the organic matters.

When the solution is mixed with chloride of silver immediately after it has been employed, and before it has had time to become discoloured, the colouring does not take place, and it may be employed again.

The canvas, when dry, may be put into the hands of the painter without any further preparation.

Some photographers employ white of egg instead of gelatine. The white of egg produces a glossy coating over which the pencil glides easily, and which sometimes scales off after the picture is painted upon it. Gelatine, on the contrary, forms a coating of a *mat* aspect, and so adherent that it seems to form part of the canvas itself.—*Repertoire Encyclopédique de Photographie.*

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Memoranda: Photographic, Scientific, and Practical.

Magnesium Wire.—We understand, from Messrs. Johnson and Matthey, that the practical difficulties in producing the wire from this metal (which gives such an exceedingly pure and readily applied actinic light) are now quite overcome, and they are prepared to supply it in any quantity. Photographic experimentalists will now have no difficulty in attempting photography wherever it is necessary to use an artificial light.

Iodide of Silver in the Nitrate Bath.—Dr. Hermann Vogel contributes to the 'Photographic News' some interesting facts in relation to the solubility of iodide of silver in the nitrate bath, which seem hitherto to have escaped observation, and may throw some important light on the prevalence of pin-holes in the negative in summer weather. He relates a number of experiments, which show that the higher the temperature, the smaller the proportion of iodide which the nitrate bath will hold in solution. Taking a nitrate bath very nearly saturated with iodide, he says:—"This solution of nitrate of silver was not saturated totally by the iodide, for by adding a little quantity of water it became turbid, and cleared up again on being agitated. It was not until I added 14 parts of water to 100 parts of the solution that the turbidity became permanent. This solution, saturated by dilution, behaved rather singularly. It became turbid by warming it, even by holding it in the warm hand, and cleared up by putting it in water of about 5° C. So, by warming and cooling it alternately, I could make it turbid and clear as I liked. The change of the state was but slow, and finished in about five minutes. The bath not diluted could be made turbid only by heating it to near the boiling-point.

"From these observations, it follows evidently that *iodide of silver is less soluble in a warm solution of nitrate of silver than in a cold one*, like some other substances, as, *e. g.*, carbonate of lime, sulphates of lime and soda, which are dissolved in greater quantity in cold water than in hot water. This fact also explains a phenomenon sometimes seen in photography. In summer-time often the silver-bath will become turbid, and after some time clear up, and this turbidity will return even when the bath is filtered with great care, especially when a great number of plates are silvered in it in a short time. The reason of this is simply that the silver-bath has become warm, and therefore cannot dissolve the same quantity of iodide of silver as before. Of course an older bath, more saturated with iodide of silver, will show these changes of state in a higher degree. Therefore observe this rule:—keep your silver-bath cool in summer-time. Practically, this rule is recommended already by Disderi; and in the same way Mr. Braun, of Dornach, when travelling, keeps the silver-bath in a box filled with cold water. The best temperature to be maintained will be 12° to 15° C.; for a lower temperature will make the bath of a very low sensitizing power."

Some further experiments show that the presence of alcohol, acetic acid, and nitric acid, all increase the power of the nitrate to hold iodide in solution.

The Duc de Luynes's Prize.—The editor of 'Le Moniteur de la Photographie' has some interesting observations on the various specimens sent to compete for this prize. He says:—"Among the photographic works now exhibiting at the Palais de l'Industrie, those competing for the De Luynes's prize deserve special attention. They are not only interesting and important productions, but they also show to what point photography has reached in the definite path which its progress marked out for it. It is very evident to all those who have followed, since its origin, the beautiful discovery of Nièpce, Daguerre, and Talbot, that the process of printing with salts of silver, as perfect as it has become, is only a transitory practical means, destined to be not only modified, but even abandoned for a method of printing more complete and more conformable to the printing process, at least for what concerns the great majority of applications of photography.

"The active researches undertaken up to the present day have resulted in various discoveries, such as heliographic engraving, photolithography, carbon printing, enamel photography, which, however, may all be summed up in two great methods—photography on metal, and photography on stone—for the others are, it may be said, only different applications of the same principle; and I am persuaded that all those who have studied the subject will agree with me if I add, that the perfection of the proofs upon paper by Mr. Swan, and the photographic enamels of M. Lafon de Camarsac, leave no doubt as to the possibility of soon obtaining on the same principles, and nearly with the same substances, lithographs and engraved plates nearly, if not quite, as perfect. The photolithographs by M. Lemercier, by M. Poitevin's process, whatever their dimensions, reproduce all the qualities of the negative; what little defects they exhibit will disappear with more practice and experience.

"Some proofs exhibited by M. Morvan, when compared with examples from the same negatives, taken by the ordinary processes, and placed side by side with them, exhibit the same finish and delicacy, harmony of tone and half-tone, which we admire in the best proofs taken with salts of silver.

"If, on the other hand, we examine the beautiful heliographic plates by M. Charles Nègre, and certain reproductions of a bas-relief exhibited by M. Garnier, we shall be compelled to recognize that photographic engraving really exists; and that if, instead of remaining in the hands of one or two experimentalists, it becomes perfected by practice, we shall not require to seek new methods; retouching, much as it is now necessary, will quickly become superfluous, and the process, simplified by experience, will soon adapt itself to the wants of industry, which finds it too expensive at present.

"M. Placet's method, we are persuaded, combines the best elements of those hitherto published, and will ultimately yield the best results. The two plates he now exhibits are of very delicate execution. Mr. Pouncy exhibits some proofs obtained in printing-ink, which, although satisfactory as experiments, still leave much to be desired.

"M. Pretsch does not appear to have made any material progress. Messrs. Simoneau and Toovey have had the idea of applying photographic pictures upon wood, which thus form a new kind of decoration in furniture. As for M. Regnault, who employs benzoin and rosin as a coating, and alcohol and water for a solvent, and thus obtains engraved metallic plates, the aspect of which reminds us of M. Fizeau's first experiments, we recommend him to follow the suggestions of MM. Nièpce and Poitevin, which, in many operators' hands, give very superior results.

"As to the photographic enamels by M. Lafon de Camarsac, it is impossible to imagine anything of the kind more perfect. M. Poitevin, among other of his numerous processes, exhibits some very curious pictures on porcelain, but they are not among the best he has obtained, and in this particular he has done neither himself nor his process justice."

Nitrate of Bismuth as a Substitute for Chloride of Gold.—M. J. Balsamo has shown, in *Cosmos*, that nitrate of bismuth can be employed as a toning-bath in place of chloride of gold. To obtain the bath the metal is dissolved in nitric acid, and an excess of acetic acid is added to prevent the formation of an insoluble subsalt when water is added. If this compound is found to answer the purpose as well as chloride of gold, it is needless to state that it will be infinitely cheaper than the latter.—Dr. PHIPSON's *Préparateur Photographe*, &c.

Explosion of Gun-Cotton.—In reference to the terrible explosion of gun-cotton, accompanied by loss of life, in the works of Messrs. Prentice and Co., Dr. Phipson, writing to the *Times*, says:—"It is supposed to have been caused by a spark from some steel machinery. Photographers will remember that a year or so ago the photographic chemist Dornbach lost his life by an explosion of gun-cotton while packing this substance into a cask by means of a wooden pole. Since that sad occurrence I have already twice stated that the explosion which killed M. Léon Dornbach was evidently caused by an electric spark. Persons who handle gun-cotton are apt to forget (or perhaps are not always aware) that it is one of the most electrical substances known, and that friction, far too slight to develope heat enough to inflame it, will develope in gun-cotton so considerable an electric tension that electric sparks may be obtained from it."

American Taxes on Photography.—There is now a bill before the American Congress by which it is proposed to lay a tax of one penny upon every photograph which costs less than one shilling; on photographs costing from one to two shillings, three-halfpence; on photographs from two to four shillings, twopence-halfpenny; and twopence-halfpenny more for every fraction of a dollar, when the price of the picture exceeds that amount. The photographers of Boston have had a meeting, at which they resolved upon a general increase of 25 per cent. to the public in consequence of this tax. The Philadelphia photographers have agreed to an advance of 50 per cent.

Iron-development without Intensifying.—The Rev. Wm. Law sends to a contemporary a formula for an iron-developer, which, it is stated, gives negatives with sufficient vigour without a second intensifying process. It is as follows:—

Protosulphate of iron	6 oz.
Sulphate of ammonia	1 „
Crystallized sugar-candy....	1 „

Dissolve each of these separately in sufficient boiling distilled water to make a saturated solution, mix the three solutions together in an open shallow dish, and put the vessel aside to allow the mixture to crystallize. Of these crystals of ammonia-saccharo-sulphate of iron, take from 30 to 40 grains and dissolve in an ounce of distilled water, and then add from 50 to 60 minims of glacial acetic acid and from 25 to 35 grains of citric acid. The solution is of a pale lemon-tint, and keeps well.

The Yellow Colour in Faded Prints.—Mr. Carey Lea, writing to *Silliman's Journal*, doubts whether the fading and yellowness is due to sulphide of silver, as generally alleged. He says: "Sulphide of silver we know as a jet-black substance, and we habitually convert the reduced silver of negatives into sulphide when we wish to intensify them. Why, then, should the production of sulphide of silver strengthen a negative and destroy a print?

"MM. Davanne and Girard answer as follows:—Sulphide of silver prepared by itself is, they say, black; but, formed in presence of organic matter, the organic matter enters into the composition, and the compound is yellow. To prove this, they precipitate a solution of silver with sulphuretted hydrogen, and find it violet-black. They again precipitate the same solution in presence of starch, and obtain a yellow precipitate." The following results were obtained by Mr. Lea:—

"In a test-tube was placed a little boiled starch, in a second tube some water. Two or three drops of a five-per-cent. solution of nitrate of silver were added to each, and then hydrosulphate of ammonia. *Both* solutions gave a yellowish-brown precipitate without the slightest difference in shade or colour. The precipitate afforded by hydrosulphate of ammonia could not here differ from that produced by sulphuretted hydrogen; but, to remove any doubt on this score, the experiment was carefully repeated with sulphuretted hydrogen. The same result precisely was obtained. As a further confirmation, the experiment was varied by the substitution of another organic substance, viz. collodion, instead of the starch. The result was precisely similar.

"The different result obtained by MM. Davanne and Girard can perhaps be explained as follows:—The sulphide of silver is a heavy substance, and when thrown down from a simple watery solution it quickly subsides. But solutions thickened with organic matter, such as gum, starch, gelatine, &c., retain a precipitate for a long time in a state of suspension, thus preserving the original yellowish-brown appearance. If, therefore, we prepare solutions as above, and pass H S through them, allowing them to subside, and examine them only after a time, we shall find in the one case a black precipitate below a colourless solution, in the other a brownish viscid liquid. But if we watch the process from the outset, we shall see that the reactions are chemically identical, and differ only in respect to the mechanical suspension which takes place in the one case.

"The experiment which I here cite may throw some light on the origin of the yellow colour. It appears that when the sulphide of silver is in a state of very fine division its colour is yellowish brown, as may be easily ascertained by treating a very dilute solution (*e.g.* 1-5000th) of nitrate of silver with hydrosulphate of ammonia. Many substances are only black in consequence of excessive intensity of colour. Lampblack, for example, in a state of excessively fine division is yellowish brown. Ink diluted is purple. Claus has shown that the intensely black hydrated sesquioxide of ruthenium is, when very finely divided, green.

"I therefore conclude:—

"1st. That it is as yet not absolutely demonstrated (although probable) that the current opinion, ascribing the fading of pictures to the production of sulphide of silver, is correct.

"2nd. That, if this opinion be correct, there exists no evidence that organic compounds have anything to do with the production of a yellow colour, the tint of sulphide of silver found in their presence and in their absence being quite the same shade of yellow-brown."—*Silliman's Journal.*

Bichromate of Potash as a Poison.—Dr. Cloet, in a report published in the *Annales d'Hygiène*, in reference to the disease observed in a manufactory of bichromate of potash, says:—"This salt in small doses, say a few grains, acts as a purgative; if in larger doses, say fifteen grains, it acts as a poison. A workman in a factory put some bichromate into a barrel of cider, by way of joke; the cider was rendered dark in colour, but still the other workmen drank of it, and were all affected with severe colic and diarrhœa. Disease of the nostril has been produced by workmen who, having stained their fingers with the salt, have put them into the nostril.

"In transforming neutral chromate of potassa into bichromate, by means of acid, the vapour arising carries with it an infinity of pulverulent molecules of the product, which spread through the workshop. This cloud of particles is easily visible in a ray of sunlight. The molecules inspired give a bitter and very disagreeable taste to the palate; but as profuse salivation is the result, the chromate is thrown off in the saliva, and has not time to inflict any permanent injury. If, however, respiration be made through the nose, the molecules are dissolved in the layer of secretion which lies on the membrane, creating a violent pricking, suffusion of tears, and irresistible sneezing. In time, the membrane begins to be thrown off, and portions of it are carried into the handkerchief used in blowing the nose; this process, when once started, goes on so rapidly, that after a period of six or eight days the septum becomes thin, permeated with openings, and is ultimately detached altogether. Snuff-takers escape this evil.

"On the skin, in its normal state, and intact, the bichromate exercises no baleful influence; the hand may, in fact, be plunged into a hot concentrated solution of the salt without fear; the hand may also be covered with the salt for an entire day without any observed effect; but if the skin is torn or abraded, however triflingly, by the prick of a pin for example, a sharp pain is felt on contact of the salt, and if it be left in contact with the wound, the caustic character of the salt is brought out intensely, the cutaneous tissue is decomposed, and violent inflammation is established. These symptoms are accompanied with intense pain, especially in winter when the cold is severe; the action of the salt does not cease until the cauterization has penetrated to the bone.

"When the skin is abraded, and the bichromate has produced ulceration, the best treatment is to wash the part thoroughly with a feebly alkaline water; then, if inflammatory action follows, to poultice, and afterwards freely apply subacetate of lead in solution."

The New Copyright Bill.—The committee entrusted with this Bill have reported that, as the subject is too important for hasty dealing with, they will not present anything further for the consideration of the House this session.

Piracy and Photography.—Mr. Bowen May, in a report made to the Association of Photographers for the Protection of Copyright, of which he is the solicitor, states that the total number of piracy cases placed in his hands, or coming to his knowledge, up to the 31st May, 1864, was twenty-two. To maintain the copyright of the members, it has been necessary to bring actions in twelve cases, and to institute proceedings in the police court on three occasions. In these cases the offenders have paid the damages named by the proprietors of the respective copyrights, and also the expenses incurred, and signed agreements not to offend again, with a penalty in case of breach; and they have destroyed the piratical stock and also the negatives. The total amount of damages recovered and handed over to the members amounts to £74 8*s*. From another report by the same gentleman, it appears that ninety-seven cases of piracy of engravings, by means of photography, occurred during the year.

What Becomes of all the Photographs?—The Paris correspondent of a daily paper says:—Will somebody, a living note and query, tell me why in a new street the three same trades are always first established? They build quick in Paris, but no sooner is the skeleton of "No. 1 Boulevard de l'Empereur de Mexique" covered with bricks than the *rez de chaussée* is taken for the sale of "canes and umbrellas," No. 2 is pounced upon for a "Magazine of Eatables," and then, as certain as death and quarter-day, comes the inevitable photographist. As for photographs, they are a mystery. Whole parishes must be photographed every day, if the "artistic talent of this vast city" (I quote a speech of the Minister of the Beaux Arts) is to be adequately remunerated. Who are all these photographed people? Really, sometimes I am inclined to think that artistic resurrectionists must seize on sleeping men, put them in sacks, take them off on their shoulders, and deliver them to the operator. Perhaps, too, this might account for some of the dead-alive counterfeit presentments which we daily see bound in red and gold and placed conspicuously on the best table.

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Photography at the Horticultural Gardens.

At the late fête given at these Gardens in aid of the Female Schools of Art, the Viscountess Hawarden kindly undertook to take portraits of all who desired, on payment for the same. So successful were her labours, that upwards of £50 were received for the funds from this act of kindness of her ladyship.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

J. W. D.—The specimen of Mr. Solomon's oiled muslin, for protection against the actinism of light, is perfect. It entirely answers the purpose for which it is intended.

Amateur.—We cannot advise you where a travelling photographic carriage may be procured. Some time since, Mr. Frith, of Reigate, offered his for sale; but whether sold or not, we cannot say.

Old Member.—You will receive a notice, in a few days, where the picture of 'Bringing Home the May' will be delivered. Some delay has occurred in consequence of the lithographic inscription added. All Members who have paid their subscriptions for this year will be entitled to it.

Invalid.—We scarcely think that the use of the cyanide of potassium can be the sole cause. That the fumes arising from cyanide are very pernicious is certain. A small portion inserted in a cabinet of entomological specimens entirely destroys all animal life. We always use the hyposulphite of soda.

We have refrained from the insertion of any review of the present Exhibition for the same reasons as stated on a previous occasion; but, as a matter of record, a notice will appear in our next Number.

Letters of inquiry to the Editor can be answered only through the medium of Answers to Correspondents.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 148. AUGUST 15, 1864.

It has been our custom in former years to refrain from any direct criticism on the contributions forwarded to the Photographic Exhibition; but we have generally republished, in the pages of the Journal, the most important articles which have appeared in the contemporary press, or copious extracts from such articles. From a variety of causes, the press notices of the Exhibition just closed have been less numerous, comprehensive, and intelligent than in former years, and, with one exception (which will be found on another page), they have not possessed sufficient interest to induce us to reproduce them for our readers. Without searching for occult reasons for this falling-off in general criticisms, it is perhaps easily explained by the fact that the Exhibition has been held at a time when the pressure of parliamentary intelligence, and the claims of many art-exhibitions, open at the same time, have left but little space or time for extended notices of any. It may be further added, that possibly the limited extent of the Exhibition, and the strictly photographic character which was thus rendered necessary, may have curtailed to some extent the public and general interest of such an Exhibition.

Probably the same causes may have operated to some degree in circumscribing the number of visitors, and rendering the pecuniary results of the Exhibition less satisfactory than might have been desired. It was thought by the Council of the Society that an Exhibition held during the London season would afford facilities for the visits of that portion of society whose tastes and education would probably give them an interest in the progress of our art, and secure larger attendance than had hitherto been obtained for the winter exhibitions. In this respect, then, anticipations have not been altogether realized, less, we believe, from any diminished public interest in photography than from other causes, upon which, at some future time, we may probably have something to say.

In regard to the general character of the contributions, we have pleasure in remarking that they indicate in a very satisfactory manner the wide-spread excellence which now characterizes the practice of photography. Of the whole number of pictures exhibited (over 270 frames), we may venture to affirm there were none without many points of excellence, whilst nearly an equal additional number of specimens which were not hung were rejected rather for want of space on the walls than for want of merit in the pictures. It is a somewhat noteworthy circumstance, in speaking of the quality of the pictures, that the whole of the exhibited specimens, with but one exception, were by the wet-collodion process, neither the calotype process nor dry-collodion being represented. The progress in the application of photography to the printing-press was very marked—the whole of the contributions being good, and each distinct process having its own distinctive excellence. The photolithographs of Mr. Toovey (to whom was awarded the medal for this class) were regarded as possessing the most artistic qualities in result, in a direction presenting many difficulties. They consisted in reproductions of paintings and drawings possessing half-tone, and they possessed a degree of excellence we have not hitherto seen attained in that direction. We are glad to state that Mr. Toovey, although practising in Brussels, is an Englishman, and that to one of our own countrymen the credit of the best results hitherto obtained in photolithography is due. The photozincographs after nature, by Col. Sir. H. James, show marked improvement; and the photolithographic reproductions in line, from pen-and-ink drawings, of Mr. Osborne possess a firmness, clearness, and solidity not before attained, and give them at once commercial value of a high order. The carbon pictures at the Exhibition were far in advance of anything we have seen at previous Exhibitions, and, whether produced by the process of Mr. Swan, as exemplified by Mr. Cooper, or by the process of Poitevin, as exemplified by Mr. Bingham, leave nothing in colour or gradation, delicacy or vigour, to be desired.

It is scarcely within the province, however, of the Society's Journal to enter into detailed criticism upon the pictures sent to the Society's Exhibition. The decision of the adjudicators in regard to the medals was published in our last; and, had their decisions been unanimous, we should doubtless have had the pleasure of publishing a report entering more fully into an estimate of the works examined; but, in the absence of unanimity, it was obviously impossible to do so. We have one word, however, to say on the subject of the adjudication. It must be quite clear to all our readers that, in arriving at a decision on questions of taste, there must always be great room for difference in opinion. Even a unanimous decision on the part of a Committee would not meet with universal approbation from the public; but we have to observe that, in the present instance, the difficulty of arriving at a unanimous decision arose very largely out of the great excellence of so many of the competing contributors. With but one or two good pictures to choose from, a selection might easily have been made; but where there were so many, each perfect of its kind, but slightly differing, not in degree of merit, but in the elements upon which the merit depended, the sources of difference in opinion became multiplied, and the difficulty of unanimity enhanced. Our readers will therefore readily see that in the divided opinions, and the decision arrived at only by a majority, they have the best assurance of the earnestness and anxiety of the Committee in endeavouring to arrive at a just result, and of the uniformity of merit which characterized many of the pictures.

We may here add that those contributors who have not yet removed their pictures from the premises in Pall Mall should not delay to communicate with the Secretary their instructions regarding them.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A Council Meeting was held, July 21st, at 12 York Place, Portman Square,—Lieut.-Col. the Hon. D. F. de Ros in the Chair.

The Minutes of the last Meeting having been read and confirmed, the following Members and Subscribers were elected:—

F. Newton, Esq., J. R. Lane, Esq., Mrs. Geo. Booth, Miss A. Ripley, A. Milligan, Esq., Captain Bryon, E. S. Bowlby, Esq., Dorabgee Pundumgee, W. D. Howard, Esq., Rev. W. A. Bathurst, H. J. Freshwater, Esq., E. O. Hollist, Esq., R.A., R. Brown, Esq., J. J. Benyon, Esq., J. Wales, Esq.

The following Members of Council were then proposed and elected:—

The Earl of Rosse, Arthur Farre, Esq., M.D., Major Durnford, the Hon. L. Wingfield, Walter Prideaux, Esq., Major Russell.

The examination of the photographs which had been contributed by the Members during the year was then proceeded with; but, owing to their high average and the large number of meritorious pictures in every class requiring most careful consideration, it was found to be impossible at once to make the award.

The further examination and classification of the pictures were then referred to the referees, who promised to report on them as soon as they could arrange them satisfactorily, with the view of assisting the Council in their difficult task. The proceedings then terminated.

A. J. Melhuish, *Hon. Sec.*

The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors.

No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith. The same proviso extends to communications to the Editor.

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Photographic Exhibition.

If the progress and prospects of photography should be estimated by this, the tenth Exhibition of the Photographic Society, they would appear to be very unsatisfactory indeed. It is decidedly the least interesting display that has yet been set before the London public. There is no new application of the principles of the art, nor is there anything remarkable in the practice or manipulation of those whose specimens make up the contents of the Exhibition. As compared even with that of last year, the present collection is dull and dreary in the extreme. Surely the Council might have exercised a little more supervision over the admission of the specimens, and saved us from being tormented with frames full of *cartes de visite*, as though we were not surfeited, *ad nauseam*, with similar wares at every turning. In an Exhibition under the direction of a constituted body like the Photographic Society, we look for something more than we can see in every shop-window. In previous Exhibitions we have been able to form some idea of the condition and prospects of the art both here and on the Continent; but, in the present one, we see nothing more than may be readily noted in a walk down Regent Street on any day in the week.

The removal of the Exhibition from the gallery in Suffolk Street to the small gallery in Pall Mall belonging to the Female Artists has been imposed upon the Society by the change of their season from winter to summer; but still we think the removal is unfortunate for its prestige. It is suggestive of a collapse when we see that the display is not only a poor, but a very small one; and, indeed, there are many indications that the issue of the battle which has been waged for so many years between Photography on the one hand and intelligent Art on the other is about to be decided in favour of Art, and that Photography must subside into its proper and most useful place as the handmaid of Art.

The rage for *cartes de visite* is sensibly abated, and we now see, cropping up in the shop-windows, admirably coloured French photographs from the pictures of Meisonnier and other able painters, the production of which we take to be a sign of an improving public taste. The present Exhibition is the only place wherein we find no traces of what is doing abroad—no examples showing the value of the process in reproducing rare and original works—no good specimens of its application to Government purposes, the only contribution from the Government photographer being a single plate illustrating the effects of shot and shell upon iron armour-plates. Where are we to look for the productions of the fine lenses of Venice, of Rome, and of Switzerland? How are we to know what has been done lately in the way of copying drawings and manuscripts? What is being done by photographers in Virginia on the battle-fields?—what in India, China, at the Cape, in Algeria? The tenth Exhibition of the Photographic Society tells us nothing of any of these matters. The Council have provided several frames of *cartes de visite*, some hideous enlargements from these, some small equestrian portraits, and such ordinary landscape-studies as we have seen for many years past; add to these a very imperfect collection of Indian photographs by Mr. D. H. Macfarlane, some ordinary English reproductions of foreign places, and some specimens of photolithography by Mr. W. Toovey; and we have brought together a collection forming the poorest exhibition the Society has yet set forth.

The amateur exhibitors appear to have contributed some of the most interesting specimens in the room. Mrs. Cameron sends some studies of heads, produced by the adoption of Mr. Wynfield's method, which are very good: among these are portraits of Holman Hunt and Henry Taylor. Mr. Wynfield's portraits of artists are now well known, although none of them are to be seen in this Exhibition; and Mrs. Cameron's photographs are only inferior because her artistic knowledge is inferior to that which is the chief characteristic of those produced by her master. Lady Hawarden, whose pretty studies we noted last year, has improved upon them, and contributes some "Studies from Life," beautifully arranged under natural effects of light and shadow. Eight views of Burnham Beeches, from the lens of the Hon. H. W. Vernon, may be noted as being more agreeable and more apparently natural than the generality of landscape-studies in the room, which are the result of perfectly accurate focusing and faultless manipulation.

We take Mr. Bedford's views to be amongst the best examples of what is called good photography; but, although they give abundance of detail, they fail to express, in any appreciable degree, the more important effects of atmosphere. Lieut.-Col. Verschoyle has made some attempts to photograph atmospheric effects—not altogether without success; but the powers of photography are at present limited in this direction, so far as we know, and we are only reminded of the suggestiveness and mystery of nature by impressions which, photographically speaking, are failures. After all, the process, invaluable though it be as an aid to the artist, conveys a very limited amount of truth to the mind: it gives the true impression of neither persons nor places; and, unless we have some previous knowledge of the scenes or of the individuals that it professes to represent, we almost invariably conceive a false notion about them.

The portraits are, as we have said, for the most part either the ordinary *cartes de visite* or enlargements from them. These photographic likenesses bring out all that is most vulgar and pretentious in our age—officers and civilians attitudinizing in their respective uniforms, and, worse still, clergymen, with the Bible in their hands, in their preaching-attitudes (fancy St. Paul posing himself for a photograph in the attitude in which he addressed the Athenians)—ladies in moire antique and babies in long clothes—all bidding for public notice. There may be, and we believe there is, an amiable motive at the bottom of it all; but surely the great majority of these good people might forbid the public exhibition of their beauty or ugliness, especially when there is no human thought or faculty present in the production of their portraits, the presence of which alone justifies the portrait-painter in the exhibition of his work, and redeems it from impertinence. The exhibition of their photographic likenesses in every shop-window is perhaps one of the penalties imposed upon public characters; but ordinary individuals are not called upon to exhibit their portraits in a photographic exhibition, unless there is really some remarkable improvement in the process by which they are gibbeted for public display.

[We have inserted the above cleverly written notice of the Exhibition, taken from the 'Reader;' for although we cannot agree in many of the observations of the writer, yet we believe that photographers may read it with some interest.—Ed.]

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Caution to Photographers.—The Copyright Act of Engravings.—On Saturday an action was brought in the Westminster County Court, by Mr. M'Lean, against a shopkeeper in High Holborn, named Hall, to recover compensation for an infringement of the Copyright Act of Engravings by selling a print of the "Prisoner's Widow." The damages were laid at £10. The plaintiff stated that he had paid £700 for the engraving of the plate of his picture, and £150 to the artist for the copyright, making £850. The print had since been photographed; and the piratical traffic had been carried on to such an extent as to do incalculable injury to the publishers, who spent such large sums of money. The Judge considered that the defendant had rendered himself liable under the Act, and accordingly made an order for the amount of damages claimed and costs, amounting altogether to about £50.

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Photozincographic Reproductions of Scottish Records.—The public will be gratified to learn that the Right Hon. Sir William Gibson-Craig, Lord Clerk Register of Scotland, has obtained the sanction of Her Majesty's Government to a series of publications, long anxiously desired by men of letters on both sides of the Tweed, by which the national records and other materials of Scottish history under his charge will be made more easily and much more generally accessible than they have ever yet been. The details will, no doubt, be officially explained in due time; but we hear, in the meanwhile, that three principal objects are contemplated. The first, we understand, is the formation and publication of a series of calendars of the Records and State Papers of Scotland from the beginning of the reign of King James IV., in the year 1488, to the union with England in the year 1707. The second, we believe, is the publication of a series of Chronicles and Memorials of Scotland during the Middle Ages, or from the earliest Scottish annals to the end of the reign of King James V., in the year 1542. The third, as has already partly transpired, is the publication of facsimiles of the more interesting and important Scottish historical documents, from the beginning of record in Scotland in the eleventh century to the union with England in the beginning of the eighteenth. These facsimiles will be executed at the Ordnance Survey-office at Southampton by the same newly discovered process of photozincography by which facsimiles of Domesday Book, Magna Charta, and other remarkable English records and historical documents have been produced. The calendars and the chronicles and memorials will be uniform in every respect with the series of English Calendars and Chronicles now appearing under the direction of the Master of Rolls in England. But they will be published, along with the photozincography facsimiles, as a distinct Scottish series, under the direction of the Lord Clerk Register of Scotland.—*Scotsman.*

We have so frequently received communications on the subject of Mr. Archer's first introduction of collodion, and questions as to his mode of practice, that we have on the present occasion presented to our readers, *in extenso*, his valuable little work. It may have been considered as almost a privately printed book; very few were sold, and, to our knowledge, in many instances copies repassed into the hands of the author, who was always desirous, from some cause or another, of repossessing them. It is a pleasing thing, to those who worked with Mr. Archer in his early photographic pursuits, to see how perfectly he placed the collodion-practice of photography before the public; for, notwithstanding the researches of so many, the practical improvements introduced have been quite insignificant in comparison with the great stride in the art which is associated with his name.

A MANUAL OF THE COLLODION PHOTOGRAPHIC PROCESS.

By Frederick Scott Archer*.

Preface.—The Collodion Process I am about to describe, and to the elucidation of which I am anxious to devote my attention in the present manual, has already, since I first introduced it in the spring of last year, produced many beautiful results; and the facility of its manipulation offers a valuable and ready assistant to the artist, and to those who are desirous of obtaining transcripts of nature, without the exaggerated drawing and false light and shade now so much adopted in the various illustrated works of the day.

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* London: sold at 105 Great Russell Street, Bloomsbury. 1852.

Some persons express disappointment on viewing the productions of this art, because they do not find those sudden contrasts which are generally the exaggerations of the draughtsman, aiming at the improvement of his model.

The reverse of this ought to be the feeling of the true artist, who should avail himself of these faithful delineations of nature to restrain the freedom of his pencil.

Many imagine that photography may take the place of the painter's art, as more likely to give faithful portraiture, and correct views of character and detail; but it is not in this light that I look upon it as performing its true office, for the character and expression of the features are so continually varying, that in this, as in the painter's art, the same watchfulness and observation of character are necessary, and the same artistic arrangement is required.

A certain *general* expression must be sought for. Who has not observed too often in portraiture the want of that *general* expression, the absence of which mars the otherwise correct delineation of the features?

It is not my intention to enter into any detailed historical account of photography generally, but to confine myself to matter relating to the Collodion Process; and to give such instruction and advice in the manipulation, without entering into too much detail, as I consider will be of service to those who are for the first time about to work this process, and who are but little, if at all, acquainted with the art generally.

It will, however, be as well to say a few words in reference to the various experiments which led me to adopt collodion as a material so well adapted for receiving the chemical agents necessary in this beautiful art.

In the account I published in the 'Chemist' of March last year, the difficulties attending the use of paper were spoken of as being too great ever to be overcome, on account of the unevenness of its texture, and other defects.

These considerations eventually induced me to abandon its use, and seek for some other substance equally applicable; and it certainly is remarkable, that a material which may be called a modification of paper should be found so well to answer the purpose required.

My first attempts with collodion were directed to the improvement of the surface of paper, by spreading over one side a thick solution of collodion.

These essays were not successful; for after the necessary washing, &c., in the process, the collodion-film did not adhere to the paper sufficiently to be of any use.

However, previous to and during the progress of these experiments, I was trying various other substances as media, for holding the chemical agent, Zyloidin, other modifications of starch, extremely fine paper pulp, tanno-gelatine solutions, and several combinations of albumen. Each had its turn, and it was only after repeated experiments in numerous ways that I decided on collodion, as being the best and at the same time the most available substitute for paper. Its exceeding ease of manipulation, and the brilliancy of the pictures obtained with it, cannot fail to strike every one who sees them, and justifies me in the opinion I entertain of its great value and practical importance.

The strength of the film allows the removal of the drawing from the glass on which it has been produced, and this is a most distinctive feature in the process.

The readiness with which the film can be produced on glass, without the previous preparation so tedious in other processes, also gives it great practical value, particularly to those who have not much leisure to devote to the art.

It is difficult to say who first attempted to use collodion in photography, and it will hardly be a matter of much importance to pursue this inquiry; but the first publication in which it was alluded to, was that of M. G. Le Gray, of Paris, and then only incidentally, as a substance which might possibly be made available.

There is no doubt that many tried it previously to this, but as their experiments produced no results, and led to no practical end, their claims to the first use of collodion cannot be considered of much value.

FRED. SCOTT ARCHER.

14th March, 1852.

THE COLLODION PHOTOGRAPHIC PROCESS.

Introduction.—The power possessed by solar light, and in a less degree by artificial light, in producing chemical change in the various organic and metallic compounds of the earth, has excited the attention of the most able chemists and philosophers of the day.

For several centuries the darkening effect of the solar rays on chloride of silver has been remarked.

More recently Sir Humphrey Davy and Mr. Wedgwood turned their attention to this curious subject, and endeavoured, but without success, to apply it to useful purposes.

Since their time, however, and from these small beginnings, a new art has been discovered, beautiful in its results, commanding equally the attention of the artist and the man of science.

The former will avail himself of it for noting down the aspects and changes which are constantly varying the face of Nature, opening to his observation many striking effects of light and shadow, which, without its aid, would altogether escape his observation, or elude the vigilance of his pencil to note down.

The chemical philosopher will find in it a new study and wide field of research open to his view—presenting, in fact, an entirely new branch of chemical inquiry; and he cannot fail to be struck with the great power which a very feeble ray of solar light has, in producing a rapid chemical change in some bodies when presented to its influence; the consideration of which may induce him to devote some portion of his time to the investigation of a subject so interesting in its details and marvellous in its effects.

He will also observe how very large a portion of the solar rays, though not absolutely necessary to illuminate and brighten the face of the natural world, are not less essential to our well-being, and are silently working with powerful effect in producing remarkable changes, and modifying by their influence the most enduring as well as the most fragile of Nature's productions.

Moreover it is to be hoped that these investigations, and the increasing interest which the Photographic Art generally is acquiring, will induce the chemical manufacturer to direct his attention to the preparation of chemical products hitherto little in demand, which are now being sought for, and unfortunately, in too many instances, cannot be obtained of sufficient purity, or at such a price, as would warrant their immediate use in the art.

It is an important point to consider, that it is useless for photographers to endeavour to increase the energy of their sensitive surfaces, when the chemicals required are not manufactured with that purity and exactitude so absolutely necessary to ensure their success.

These remarks are not made from an over-fastidious idea of the importance attached to this branch of the subject, but from a certain conviction that no good results can in future be produced with certainty, unless the manufacture of photographic chemicals is treated in the laboratory as more worthy the consideration of the operator.

It is to be hoped that some one with ability and zeal will come forward and offer to the photographic world such a certainty of procuring pure chemicals, that this difficulty may not in future retard the progress of the art, or damp the ardour of its votaries.

The Collodion Process.—Although it is not my intention to enter into any detailed account of the chemical preparations used in this photographic process, still I am anxious to offer a few remarks with reference to the manner in which I consider the collodion-solution can be best prepared, of suitable strength and firmness; for these two qualities must be considered indispensable, especially when large surfaces of glass are to be covered. When working with small quantities these two qualities may not be considered so important as they really are; and further, when the pictures are to be rolled up, or whitened with the bichloride-of-mercury solution, the strength of the collodion is of essential importance.

My object is to promote the use of a strong and firm film, which will bear removal from the glass when this operation is considered necessary; and will equally well dry on the glass when the drawing is finished. I should first wish to point out the mode of preparing the gun-cotton, and afterwards proceed to describe the collodion-solution.

There are two receipts for making gun-cotton, from either of which a good dissolving cotton may be obtained.

Several others have been described, but I should only be confusing the subject to attempt to give the whole; and it would be foreign to the limited purpose of this work to do so.

The results, however, vary so much with the strength and proportion of the acids used, as to render it extremely difficult to name any one in particular which would entirely succeed under all circumstances. In all cases it is more easy to prepare cotton which will explode readily, and yet *not be at all soluble*, than one which will entirely dissolve in rectified sulphuric ether.

Few will be able to avail themselves of these receipts, unless they previously possess sufficient knowledge of chemistry to ensure a tolerable hope of success; for it requires considerable practice and very many trials before a good cotton can be prepared.

I give them for the use of those who are by circumstances placed in such a position as to entail upon them the necessity of preparing it themselves, when the consideration of cost cannot be taken into account.

Preparation of Gun Cotton.—Take of

Dry nitre in powder,	40	parts.
Sulphuric acid ..	60	„
Cotton..	2	„

The nitre, sulphuric acid, and cotton are weighed in the above proportions, and placed near at hand, within reach of the operator, to prevent delay in mixing when the operation has commenced.

First put the powdered nitre into a basin placed *firmly*, so that there shall be no fear of its upsetting: it is necessary that this operation should be conducted either in the open air or in some convenient situation where there is sufficient draught to carry off the nitric-acid vapour generated. Then pour the proportion of sulphuric acid into the powdered nitre, stirring them well together for a few seconds; with a strong glass rod. Immediately the two are mixed, add the cotton, having previously pulled out the fibres; and mix them well together with two glass rods, in order that the whole of the cotton may come in contact with the nitric-acid vapour, which is being rapidly generated from the mixture.

This action must be continued for about two minutes; then quickly remove the cotton with the adhering nitre and sulphuric acid from the basin, with the glass rods, and plunge it into a large quantity of water; it is to be well washed in repeated changes of water until all the acid and nitre are washed away.

The cotton is then collected together and first pressed between the hands to drain off the water, and then still further dried by pressure in a cloth; the fibres of cotton can now be carefully separated and hung up with pins to the edge of a shelf or any other convenient place to dry. There is no necessity to use artificial heat, as the small quantity requisite for a few ounces of solution can easily be dried without it.

The next receipt is by certain proportions of nitric and sulphuric acids:

Take 1 oz. by measure of nitric acid, sp.g. 1·450;
1 oz. „ sulphuric ditto, ordinary;
80 grs. by weight of cotton.

The fibres of cotton must be well separated as in the preceding mode. The two acids are first mixed, and the requisite proportion of cotton added as quickly as possible, and well stirred with two glass rods for not more than fifteen seconds; the gun-cotton is removed from the acids, and plunged into water to undergo the same washings &c. as in the former recipe.

It will be seen that the cotton is not exposed to the action of the mixed acids, in this last mode, longer than is necessary to saturate the cotton; should the action be continued further, the solubility of the cotton is entirely lost.

Water must not be spared in washing the cotton, for not a trace of acid should be left; the collodion would be injured by any remaining.

Preparation of Collodion.—It is not easy to give the exact proportions of gun-cotton to be added to the rectified sulphuric ether to prepare the collodion-solution, as this must depend entirely upon the strength and thickness required. In the ordinary way, it is better in the first instance to make a thick solution, and after having filtered off the insoluble portion of the cotton, to dilute the remainder when required for use.

It will be better for parties to depend upon their own experience after a few trials than to look for exact proportions in a recipe. By taking an ounce or two of ether, and adding the cotton by degrees, and well shaking between each addition, the solution can be tempered to any required thickness.

Also the thickness of the collodion must depend upon the skill and dexterity of the operator, and the season of the year.

In the commencement of the practice of this process the amateur should be careful not to use a very thick solution, especially if the weather be warm, as the quickness of the evaporation and the necessary slowness of his movements would render it unmanageable in his hands.

These considerations render it difficult to recommend any fixed and exact proportions; but whatever may be the thickness of the solution, great care should be taken to obtain a collodion which will, when evaporated on a surface of glass, be sufficiently strong to bear removal when necessary.

This must be considered a most important point; for otherwise, if the film is weak, it cannot possibly be expected to bear the washings and various changes the operator may wish it to undergo.

The strength of this film can be tested in a general way, by pouring a small quantity on to a piece of glass, and, when the surface has set a little, removing the film as a thin delicate skin. This can be done by taking the edge of it between the fingers, and gently removing it from the glass.

If the collodion is sufficiently strong, it will bear in this way almost entire removal from the glass. The sensibility of the collodion to light is also very much influenced by its strength or weakness; and it may be considered as a general rule, within certain limits, that the weaker the collodion the more sensitive it will be to light.

In this view of the matter, it is consequently necessary to avoid the two extremes, of a very strong film or a very weak one.

The reason of this I will endeavour to explain. The quantity of solution of iodide of silver which a certain solution of collodion can be made to take up depends in a great measure on the quantity of alcohol in the collodion; and it will be found that if the collodion is very strong, it cannot be made to take up much iodide of silver; but by adding alcohol, it is possible still further to iodize the solution. However, this can only be done by sacrificing the strength of the film, for the more alcohol you add to the collodion, the weaker it must become; and this arises not less from the addition of alcohol than from the much larger quantity of iodide of silver in the film, which the addition of the alcohol gives it the power of dissolving.

To iodize the Collodion.—The next step is to iodize the collodion. In the first place, a solution of iodide of silver, dissolved in an alcoholic solution of iodide of potassium, must be prepared.

The mode I gave in my first account of the collodion process, in the March Number of the 'Chemist' for 1851, is the most ready way of obtaining this solution.

Prepare a saturated solution of iodide of potassium in alcohol, say 1 oz., and add to it as much iodide of silver as it will take up. Or to 1 oz. of alcohol add an excess both of iodide of potassium and iodide of silver; after a day or two, and with repeated shaking at intervals to facilitate the operation, a saturated solution of the two salts will be obtained; and if this is filtered off into another bottle, it will always be found ready for use. The first bottle can be kept as a stock bottle, to obtain a still further supply by replenishing it with alcohol, and adding now and then small additional quantities of the two salts.

The iodide of silver can be readily obtained by precipitation. For instance, take 1 oz. of solution of nitrate of silver used in the process, 30 grs. of nitrate of silver to 1 oz. of water, and add to it sufficient of a solution of iodide of potassium in water as will throw down the whole of the nitrate of silver as an iodide. When this precipitated iodide of silver has settled, which it very readily does, the liquid above must be poured off, and fresh water added, repeating this washing several times.

The iodide of silver after this is nearly dried, and then put into a bottle with a small quantity of alcohol, just sufficient to keep it moistened. The quantity of this solution of iodide of silver which can be added to 1 oz. of collodion must depend upon the quantity of alcohol in the collodion, as I have previously remarked; so that exact proportions cannot be given; but with ordinary care and a little caution there will be found no difficulty on this point; and if, after having put (say) 5 drops of the solution to 1 oz. of collodion, it is found weak in colour, more must be added until the requisite density is obtained, which can be judged of by pouring a little on to a slip of glass and dipping it into the nitrate-of-silver bath.

The collodion cannot be used directly after iodizing; the drawing made with it would be full of spots: it requires at least a day to settle; and great care must be taken afterwards not to disturb any sediment there may happen to be at the bottom of the bottle. The solution should be kept in a cool place, especially in summer.

Having now given directions for the preparation of the iodized collodion, I will proceed to describe the manner in which it can be used to most advantage.

Since I first published the process, various modifications in the manipulations, and strength of the solutions, have been suggested; as, however, they do not differ materially from the original mode, there will be little gained by giving them in detail.

A small quantity of bromide or fluoride of potassium, or of arsenious acid, may be added to the solution. However, they do not accelerate to any great degree.

A stronger solution of nitrate of silver may be used at times with advantage, as it would tend to increase the sensibility of the preparation; but it would be liable nevertheless to dissolve out the iodide of silver from the film, when immersed in it, unless a small quantity of iodide of silver be previously dissolved in it.

This peculiarity will be best shown by the following experiment:—Prepare a strip of glass with collodion; iodize it in the nitrate-of-silver bath, and afterwards allow it to dry, placing it at a small angle against any support. Presently, from the evaporation of the silver-solution on the surface of the film, the iodide of silver will be gradually dissolved out, leaving the collodion-film colourless and transparent. It will thus be seen, that although the weak solution has not this power, it acquires it at once by evaporation.

The advantages gained by using a stronger bath of nitrate of silver do not, in my experience, counterbalance the increased expense. I shall, therefore, give the old proportions, 30 grs. nitrate of silver to 1 oz. of water, as being the most economical and giving the least trouble.

It is not necessary to protect this solution from the light. By careful filtration now and then, it may be used for twelve months without having lost any perceptible strength.

Before I proceed further with the details of the process, it will be well to enumerate a few precautions. It is not necessary to have plate glass, especially when the pictures remain on the glass; good flatted crown I have found to answer very well when small surfaces are to be covered. Any kind of glass, however, which is free from scratches or specks will answer the purpose, although, when the pictures are to be removed during an excursion, a better kind of glass must be obtained, as a surface free from any blemish, and well polished, is indispensable, in order that the film may be removed with ease. With care the same glass can be used for a great number of pictures, if its polished surface is well preserved.

It is advisable to have the glass cut about half an inch longer than the drawing to be made upon it, as a kind of handle, to prevent the fingers touching the film. The collodion is not poured entirely over the glass—the upper portion is left uncovered; with this precaution a greater facility in working the process is ensured, and there is less fear of spoiling a good drawing with finger-marks or other imperfections.

The next precaution has reference to cleaning the plates of glass. After a time it will be found a source of much annoyance and failure, if great care be not taken to keep separate the cloths used in the various stages of the process. For instance, if, after fixing a drawing with hyposulphite of soda, the hands are wiped on any particular cloth, and it should be used afterwards for cleaning a plate of glass, there is every chance that the drawing made upon it will be spoilt; for the hyposulphite of soda forms with silver a sweet gummy salt exceedingly difficult to remove from the glass, unless it undergoes a thorough washing. It will be likely to produce a streaky deposit, which entirely mars the otherwise good effects of the picture, and unfortunately it cannot be discovered until the whole process is completed.

This inconvenience may not often occur to those who have an ample stock of materials, and can throw aside a number of plates of glass to be washed at leisure; but many who are limited in means, and consequently wish to make the most of a limited supply cannot neglect this precaution with any hope of success.

In my own practice of the process, when on an excursion, I never take less than three cloths with me—one to remove the excess of moisture from the glass, the next to partially dry it, and the third to give it the final polish, just previous to the preparation of the film. An old soft silk handkerchief will be found useful to give the last polish.

It will be well to keep the different stages in the manipulation of the process distinct from each other, in order to prevent confusion. They may be divided into five sections.

The first division treats of the preparation of the film of collodion on the plate of glass.

The second, the submitting the prepared plate to the nitrate-of-silver bath.

The third, the exposure of the plate to the action of light in the camera.

The fourth, the development of the image.

The fifth, the fixing of the drawing, &c.

The Preparation of the Collodion-film: the first division.—Take the plate of glass in the left hand, holding it by one end, and with the bottle of collodion in the other hand, pour from it on to the middle of the glass such a quantity of the solution as will run in a body *freely*, and by gently tilting the glass from one corner to the other the collodion will run evenly over the surface, excepting the half-inch at the upper end. When covered, the residue is poured back into the bottle by inclining the corner of the glass nearest to it over the neck, and allowing the collodion to run off. The precaution, however, must be taken at this time to move the glass vertically backwards and forwards over the neck of the bottle, to prevent the furrowed appearance the collodion will assume if this is not attended to, and which in some measure will injure the delicacy of the drawing.

After a few trials the operator cannot fail to conduct this part of the manipulation with sufficient dexterity to obtain the desired evenness in the coating. After this, the glass, more particularly in cold and damp weather, should be allowed to dry for a short time, until, in fact, the ether has evaporated, and the film is damp only with the alcohol remaining in it.

Immersion in the Bath: the second division.—The plate of glass prepared as above, and partially dried, is next submitted to the action of the nitrate-of-silver bath of the following strength:—

Crystallized nitrate of silver	30 grs.
Water	1 oz.

This is an operation of much nicety, and requires a steady hand and some little care. The plate is held firmly in the hand, and plunged *at one motion* into the bath; otherwise, if any halt is allowed, a line will be produced across the plate, however short a time the stoppage may be.

It should remain in the bath about one minute, for the double purpose of saturating the film with iodide of silver and removing the oily or streaky appearance from its surface; which latter effect would, if allowed to remain, cause an unequal sensibility in the coating, and consequently an unequal development of the image, which nothing can afterwards efface.

In my own practice of the process, I generally find it more convenient and cleanly to use a glass bath, so contrived as to allow the light to act upon the prepared plate whilst in it, and during the saturation of the film; consequently the two operations are conducted at the same time. The prepared glass, therefore, need not be removed from the bath until the light has performed its part, and the development of the image can be proceeded with.

The contrivance for this purpose with the glass bath is very simple, as it merely requires that the inside of the front glass of the bath should be adjusted to the same plane in obtaining the focus as the ground-glass screen.

Thus, as I have said above, the saturation of the film and the action of light are going on at the same time. This plan, particularly with large plates, ensures more certainty in the operations. There is also less liability of the film becoming stained or injured by contact with the sides of the frame into which it is placed in the camera.

It is possible, however, that this plan, although it offers many advantages, cannot be made available, from the difficulty of procuring the kind of bath it requires. I shall, therefore, defer any further remarks on this point until I come to speak of the Camera, and proceed with the manipulation, employing the old plan of placing the plate after removal from the bath into the previously adjusted frame of the camera.

Exposure of the prepared Plate to the Action of Light.—The *third division* in the process consists in submitting the sensitive film *immediately* it is removed from the bath to the camera-action. It will be a saving of time if, whilst the plate is in the bath, the focus and the adjustment of the sitter (if a portrait is to be taken) are attended to; for it is necessary, as I have just said, that the prepared plate should be submitted to the light directly it is taken from the silver bath, as its sensibility diminishes rapidly.

The length of time necessary to expose the plate in the camera, it is obvious, must depend both upon the power of the lens and the intensity of the reflected image; and as the time may vary from one moment to a quarter of an hour, it would be useless to give any precise directions: the operator's own experience, after a time, will be his best guide. If a positive image is required, less exposure in the camera is necessary; on the other hand, a negative, to print from, will require longer exposure, as considerably more body in the resulting deposit must be accumulated, for it is by means of the varying thickness and density of the shades the requisite effect in the after printing is produced.

It should be decided, before exposing the plate in the camera, whether a positive or negative drawing is desired, in order to vary the time of exposure accordingly.

The Development of the Image: the fourth division.—After exposure in the camera, nothing is visible on the glass. The image must be developed.

This operation is nothing more than making visible to the eye an exceedingly faint and delicate picture which the light, reflected through the lens, has impressed upon the surface of the film; it is, in fact, a continuation of the action of light, which action is the commencement of the reduction of the iodide of silver contained in the collodion to the metallic state, carried on, when thus commenced in the camera, by the reducing agent employed.

This effect is most apparent when a layer of albumen on glass is employed to hold the chemical agents, when it very often presents more the effect of plating by mechanical means than the result of the apparently feeble action of a ray of light.

There are many chemical salts possessed of this power, of reducing the salts of silver when in solution to the metallic state.

The salts generally employed are pyrogallic acid, protonitrate and protosulphate of iron. The great power shown by pyrogallic acid in bringing out the latent image was first made known by me in a short description, in the May Number of the 'Chemist' for 1850. I then pointed out a mode of using it, so as to produce an exceedingly sensitive surface; in that formula, however, acetic acid was the solvent both for the nitrate of silver and pyrogallic acid solutions. Even then its action was very energetic, requiring no after wash to bring out the image; it is also equally rapid when used in connexion with a surface of albumenized glass.

I will give the formula for pyrogallic acid; the other two agents named above may require a few words presently:—

Pyrogallic acid................	3 grs.
Water	1 oz.
Acetic acid	1 dr.

Mix the water and acetic acid first, then add the pyrogallic acid.

Take a small quantity of this solution in a porcelain cup or glass measure, kept expressly for the purpose, and pour it over the prepared glass immediately after removing it from the camera. This should be done with a quick motion of the hand, in order to facilitate its spreading equally, and at once, over the whole surface of the glass. If the plate should be very dry after exposure in the camera, a slight immersion in the bath, before throwing on the developing liquid, will be of advantage.

The development must not be continued after the liquid floating on the glass has changed colour or deposited any sediment. The drawing would be injured if the action is continued thus far. If the image is not produced sufficiently strong before this decomposition comes on, it may be considered an indication that the exposure in the camera has been too short; and suggests its own remedy in the next trial.

The production of the image with the protonitrate of iron can be conducted in the same manner as with the pyrogallic-acid solution, taking care to add just sufficient acetic acid to the protonitrate to cause it to flow freely on the glass.

The protonitrate of iron, as prepared by the action of weak nitric acid on iron filings, is a good developing agent; but there is one difficulty attending it, which at times will be felt a serious bar to its use.

It is the impossibility, commercially speaking, of obtaining it as a crystallized salt; and being an easily decomposed solution, it would not be convenient to prepare by this means any large quantity at once, certainly not more than sufficient for a day or two's consumption.

My own experience, resulting from some experiments recently made, is more favourable to the preparation of a solution in definite proportions of the two salts, the protonitrate and protosulphate of iron, than the use of either separately.

Crystallized nitrate of baryta and protosulphate of iron are easily obtained, and a sufficient quantity of each can be carried with the other chemicals, when about to make an excursion of any length. The small quantity of the mixed solutions of proto-nitrate and sulphate of iron, required for immediate use, can be made just previous to the commencement of operations.

Make a solution of nitrate of baryta, 40 grs. to 1 oz. of water; when dissolved, add to it 50 grs. of protosulphate of iron in powder; stir the mixture with a rod, and when the sulphate of iron is all dissolved, allow the precipitated sulphate of baryta to subside; when the liquid above becomes clear, it is ready for use. It is a solution of protonitrate of iron, with a small quantity of sulphate of iron. Add to every ounce of this about ½ a dr. of acetic acid.

Fixing the Image: fifth division.—When the development has continued a sufficient time, and the picture has acquired its full perfection and depth of tone, it is slightly washed with water, and a small quantity of a strong solution of hyposulphite of soda is poured on from a cup kept for this purpose. The hyposulphite must be poured off and on for several times in succession, giving the plate a little motion to facilitate the liquid penetrating the film. It will very soon begin to dissolve out the undecomposed iodide of silver, removing as it were a kind of veil from the picture which previously concealed its details.

Hyposulphite of soda may not be at hand; should this be the case, a weak solution of iodide of potassium can be used to effect the fixing of the image and removal of the iodide of silver.

A saturated solution of common salt will be found also to fix the drawing, although it will not dissolve out the iodide of silver, and may be useful when the two preceding salts are not at hand.

When the action of the fixing agent has been continued long enough, which is indicated by the entire removal of the milky appearance of the film, the drawing is well washed in water, or water is poured over it, if the surface is sufficiently strong to bear this mode.

A careful washing is necessary, for not a trace of hyposulphite should be left on the film, as its presence would cause an obliteration of the image after a short time. When properly washed, it is dried at the ordinary temperature, and can afterwards be varnished and mounted, as the taste and means of the operator may suggest.

In working this process, too much care cannot be taken to protect the surface of collodion, after immersion in the nitrate-of-silver bath, from the action of diffused daylight or the too near application of the light of a candle or lamp. For it is, when first removed from the bath, susceptible of very weak impressions, and very many of the failures and disappointments of beginners, there is no doubt, arise from this cause. A certain disagreeable haze will appear all over the drawing, quite different from the marks and streaks produced from the use of dirty or imperfectly cleaned glass.

The above description includes the whole of the process as originally published by me in the 'Chemist.'

Although the details of each division may appear tedious and unnecessary, and perhaps are so to many, still, as guides for those who are for the first time entering upon the practice of photography, they will rather be thought wanting in minuteness than otherwise.

The Whitening Process.—The picture being thoroughly washed in plenty of water, after fixing with hyposulphite of soda, is treated in the following manner.

Prepare a saturated solution of bichloride of mercury in muriatic acid. Add one part of this solution to six of water. Pour a small quantity of it over the picture at one corner, and allow it to run evenly over the glass. It will be found immediately to deepen the tones of the picture considerably, and the positive image will almost disappear; presently a peculiar whitening will come over it, and in a short time a beautifully delicate white picture will be brought out.

The negative character of the drawing will be entirely destroyed, the white positive alone remaining. This picture, after being well washed and dried, can be varnished and preserved as a positive; but nevertheless, even after this bleaching, it can be changed into a deep-toned negative, many shades darker than it was originally, by immersing it, after a thorough washing, into a weak solution of hyposulphite of soda or a weak solution of ammonia. The white picture will vanish, and a black negative will be the result.

It is very singular that the picture can be alternately changed from a white positive to a black negative, many times in succession, and very often with improvement.

Thus, by the above process, a most perfect white positive or a deep black negative is produced, quite distinct from each other.

In the first part of this after-process it will be observed, that the effect of this bichloride-of-mercury solution is to deepen the shades of the picture, and this peculiarity can be made available to strengthen a faint image, by taking the precaution of using the solution weaker, in order that the first change may be completed before the whitening effect comes on.

The progress of the change can be stopped at this point, by the simple application of water.

The Camera.—From the commencement of my labours in photography, the difficulties appertaining to the working of the art with ease and simplicity induced me to turn my attention to the construction of an apparatus which should obviate, in a great measure, the uncertainty so frequently experienced.

A camera, therefore, which, by its proper form and adaptation to the requirements of the art, assists the operator in his labours, cannot but be considered a valuable adjunct to his stock of apparatus.

The camera as now generally constructed is adapted for home work, and will do well enough for that, when everything required is near at hand, and can be made available; but there are times when an excursion is contemplated to some distant scene;—with this object in view, what is to be done? According to the present procedure, a stock of paper or albumenized glass is prepared beforehand; its sensibility must be kept down to avoid spontaneous change, during the interval between its preparation and final development; for the attempt to prepare a very sensitive surface, and expect it to keep any time, is out of the question, as being contrary to all practical experience. Besides the above, various other precautions must be taken; but, with all this care and preparatory labour, too often the operator returns home with blank sheets of paper or imperfect drawings. The tedious delay which the long exposure of each sheet of paper, or of albumenized glass, requires in the camera, becomes, after a time, laborious and irksome.

This mode of proceeding has always appeared to me to be nothing less than meeting a difficulty half-way; which, with the proper construction of the apparatus, might be entirely overcome.

Many will meet these observations by saying that views of landscapes, or buildings, do not require such very sensitive surfaces to obtain their correct form and delineation; and therefore it matters not how long the exposure in the camera may be, as the result will be equally good.

But what progress shall we make towards bringing the art to perfection, if the possibility of obtaining the *moving* as well as the still-life portion of the scene is not kept in view, as being one great difficulty to be overcome? For instance, a landscape without cattle or other moving object—what is it but a melancholy affair? And an art which leaves out, as it were, the life of the scene cannot be considered to have arrived at that perfection, which it should be the object of its promoters to ensure.

Description of the Camera.—I will proceed to give a general description of the camera I have constructed, premising that it admits of being made as a very light folding camera, if thought necessary.

It is a wooden box, 18 inches long, 12 inches wide, and 12 inches deep, and is capable of taking a picture 10 inches square. Externally it may be thus described:—In front it has a sliding door, with a circular opening in it, to admit the lens: this sliding door enables the operator to lower, or raise, the lens, and consequently the image formed by it, on the ground glass, as the view may require. The two sides have openings cut in them, into which sleeves of india-rubber cloth are fixed, to admit the hands of the operator; and are furnished with india-rubber bands at the lower ends, which press against the wrists, and prevent the admission of light.

The back of the camera has a hinged door, fitted at its upper part with an opening of just sufficient size for the eyes, and shaped so as to fit close to the face. A black cloth is tied round this end of the camera, to prevent any ray of light penetrating at this opening. In the top of the camera near the front is inserted a piece of yellow glass, to admit a small quantity of yellow light, and is closed with a hinged door to regulate the quantity of light required.

The interior of the box is furnished with a sliding frame, to support the ground glass or the bath and the prepared plate; and it has a stop, by means of which any focus from 3 inches to 15 inches can easily be obtained.

The bottom of the camera is furnished with a gutta-percha tray, about 1 inch deep, to hold the washings, &c., when the camera is in operation.

Also, the bottom of the camera at the back has an opening cut in it, extending nearly the whole width of the camera, and as far in as the edge of the gutta-percha tray.

This opening is intended to admit, when the camera is in use, a light wooden case containing the glass bath, focusing-frame, stock of glass, and paper required in the process.

There are various other little contrivances which I have not specified, such as a drawer for the pictures, a shelf for bottles, &c.

This form of camera will admit of the following manipulation. Having placed it upon a stand pointing to the object to be taken, the hinged door at the back is opened, and the bath is three parts filled with the solution of nitrate of silver; a plate of glass is then taken from the cell, and cleaned if necessary.

The collodion is poured on in the manner previously described; when the film has set a little, it is immersed in the nitrate-of-silver bath, and the lid of the bath is closed down upon it. The next step is to obtain the focus with the ground glass: this can be done whilst the collodion is becoming iodized.

After adjusting the sliding frame to the proper focal distance, the camera must be closed, and the rest of the process conducted by passing the hands through the sleeves, and placing the eyes close to the aperture in the back of the camera, and drawing the black cloth over the front of the head.

By the aid of the yellow light admitted from the top, the operator can carry on the rest of the process. The plate is now ready for the action of light, and is taken from the bath; or the bath itself, with the plate in it, is placed in the sliding frame. The refracted image is at once thrown upon the sensitive plate. After the requisite exposure, the plate is taken from the bath, and the picture is developed with the solution previously described. The progress of this operation can be seen by the aid of the yellow light, keeping the eyes close to the aperture behind.

When, from experience, the picture is sufficiently brought out, a little water is poured on the glass to wash off the developing solution, and the drawing is partially fixed by the application of a small quantity of a solution of common salt.

The drawing may now be removed from the camera without fear of being injured by light, and the remainder of the operations can be conducted outside the camera.

If the film is sufficiently strong to bear removal from the glass, the following procedure is adopted. The plate of glass is placed horizontally upon the back lid of the camera, which is hung so as to form a temporary table, and the film is loosened from the edge of the glass with a flat strip of glass; a sheet of damp paper is then placed flat on the drawing, and rather within its upper edge; the film is turned over the end of the paper, and a glass rod is place just within the edge. The sheet of paper with the collodion in contact with it is now raised from the glass, and rolled up on the glass rod. When the drawing is entirely enclosed in the paper, the rod is removed, and the delicate film thus encased is put away into its proper receptacle, to be finally fixed and mounted at leisure.

The drawing thus rolled up can be preserved for months without injury, provided it is kept slightly damp; and if each drawing is enclosed in another sheet of paper, its preservation is still further secured.

The advantages of a camera of this kind may be thus enumerated:—

It allows the preparation on the spot of the most sensitive surfaces; their immediate use whilst the sensibility is at its maximum; the ready development of the image, and after fixing.

All these operations being carried on consecutively, the operator can, after the first trial, see what results the progress of his labours is likely to produce.

It gives him the power of shading off any portions of the view during the action of the light, by holding in front of the prepared plate and near the lens a moveable screen, or any flat piece of wood, as the case may require; thereby preventing the too rapid action and consequent solarization of the distant portions of the scene. The spire of a church, for instance, pointing upwards into a bright sky, often requires this precaution to prevent its being entirely lost. Other instances of this effect will readily suggest themselves to those at all acquainted with the art.

The camera can be made, with slight modifications, applicable to any other process on paper or glass, and of course obviates the necessity of any kind of portable tent.

Glass Bath.—The glass bath I have alluded to is thus contrived.

Two pieces of plate glass are cemented together at the sides and bottom. It tapers gradually from the top downwards, so as to form a wedge-shaped bath: consequently, when the prepared glass plate is immersed in it, the lower end of the glass comes nearly in contact with the bottom of the front glass of the bath; so that if the prepared plate, after touching the bottom of the bath, be pushed forward in the liquid, it necessarily comes in contact with the whole inner surface of the front glass of the bath. It will, therefore, be perceived that, by adjusting the bath-frame in the camera to the same distance as the ground-glass frame, the correct focus will be obtained, and the bath, with the iodized film in it, can be put into the sliding frame; the refracted image from the lens consequently strikes upon the film through the front glass.

The Photographic Lens.—The amateur will find a good lens an indispensable item in his catalogue of photographic requirements. He can have either a single lens for a landscape, or a double combination, where rapidity of action is required, as is the case with a portrait.

The use of a lens-combination of less than 7 inches or 8 inches focal length should be avoided; for the distortion attending the image formed by a lens of shorter focus than this will interfere very much with the truthfulness and correct proportions of the picture. With a very short focal length, the relative size of the objects in a picture is rapidly increased or diminished, when they are removed but slight distances from any particular plane: consequently, a combination of lenses of less focal length than that named above should not be used.

For some time past I have devoted much attention to the construction of Fluid Lenses, in which the necessity of the flint-glass lens is done away with, by the use of a fluid of such density and refractive power as will achromatize and correct the curvature of the crown or plate glass lens.

I have succeeded in the construction of such combinations, and can produce them of great power and flatness of field.

With them what are called the chemical and visual foci perfectly coincide; they do not therefore require the slightest adjustment in regard to these two difficulties.

I have used no other kind of lens for many years.

Summary of Precautions.—Keep separate the cloths for cleaning the glass, &c.

Be careful to clean the glass thoroughly.

Any cloth when once used for cleaning a plate of glass after the application of the hyposulphite of soda should be kept for this purpose alone.

Avoid the too near proximity of diffused light, or that of a candle or lamp, unless it is shaded by a yellow screen of glass.

Take care that your solutions are put into bottles with lips.

Clean the stopper and neck of the collodion bottle after each day's use.

Avoid disturbing any sediment there may be at the bottom of the iodized collodion bottle; and if there should be much sediment, pour off the clear solution from it into a clean bottle for use.

Keep separate a cup or measure for the developing solution, as also one for the application of the hyposulphite of soda.

Keep clear all the solutions by filtration.

Conclusion.—In conclusion, I do not hesitate to say, that no one with ordinary care and forethought in procuring good chemicals, and strict attention to cleanliness in the different stages of the process, will fail to meet with success; and if after a little practice a fixed method in the arrangement of the various accessories required can be attended to,—keeping, in fact, everything in good order,—the whole process will be found a source of much pleasure. In the practice of no other process at present known can such good results be obtained, with so little labour and cost.

That part of the process described at page 97, alluding to the mode employed for removing the drawing from the glass, is particularly adapted for the artist whose sole object may be to obtain sketches of nature with rapidity and ease, and to whom the labour of carrying a large stock of prepared glass would be an insurmountable objection to its use. By taking care to procure a good strong collodion, this part of the manipulation may be conducted with ease after a few trials.

I wish it to be understood, however, that it is not at all necessary, in the ordinary working of the process, to roll up, or in any way remove the pictures from the glass upon which they have been made.

When glass can easily be procured, or is at hand, it would obviously be taking unnecessary trouble to do this.

* * *

Aluminium Bronze, consisting of 95 parts of copper, and 5 parts of aluminium, is free from liability to oxidation, and will supersede silver for many purposes.

Memoranda: Photographic, Scientific, and Practical.

Important Modification of the Carbon Process.—A modification of Mr. Swan's carbon process has been published in the *Photographic News*, by which it appears paper prepared ready for a final sensitizing may be kept constantly ready for use. The method is first communicated by Mr. H. Cooper, who accredits the idea to Mr. C. K. Wild; but it appears from another letter that the plan had already been included by Mr. Swan in his specification, which is not yet published. The following is Mr. Cooper's first rough description of the process:—"Take a sheet of paper, the thinner the better, and coat it with pigmented gelatine, same proportions as for Mr. Swan's process. The gelatine need not be very thick on the surface of the paper; so that it is soon dry, it taking only two or three hours to complete that operation.

"Now there are two ways of coating the paper,—first, by floating on a dish of warm gelatine solution; and second, by the method adopted by the persons who glaze the surface of prints &c. with gelatine. The latter method would produce the most perfect results, and would, I apprehend, be the most simple and easy of application on a large scale. I must delay the *minutiæ* of this part of the process till it has been carefully experimented upon. These sheets of paper, coated with coloured gelatine, will keep an indefinite time, if placed in a dry atmosphere, and might be prepared and sold in the same matter as albuminized paper at the present time. To sensitize it, float, gelatine side down, for a minute or so on a solution of bichromate of potash or ammonia, strength about 40 grains to the ounce, and containing from 5 to 10 per cent. of alcohol; the use of the latter is to cause the solution to permeate the gelatine more evenly and quickly. Some further trials are necessary to determine the requisite strength, as too strong a solution would tend to render the film insoluble, and one too weak would necessitate longer printing.

"When the paper is dry, it is to be exposed under a negative, the printing *not* to be effected *through the paper*, as in Mr. Pouncy's process, *but on the surface in the ordinary way*. When removed from the pressure-frame, it is to be mounted face downwards on another piece of paper, with india-rubber, or by the following method:—Moisten the *back* of a piece of albuminized paper, by laying it on a pad of wet blotting-paper, and when the surface has become tacky, press the tissue on it, of course taking care that no air-bubbles intervene; if the tissue be thick, breathing slightly on the gelatine side will prevent its curling when placed on the damp paper; whilst moist (but not *wet*), saturate the paper with strong methylated alcohol, by passing a sponge dipped in that liquid over the back of the paper; it is as well to prevent the spirit touching the gelatine surface. The alcohol will coagulate the albumen and cause it to hold the tissue and paper so firmly together, that under any amount of washing I have not observed the least tendency to curl up at the edges or separate. It is then ready to develope. Upon placing it in warm water the paper that was originally attached to the gelatine will come away, allowing the parts that remain unaltered by light to be washed off; and as the water acts upon the side *not printed upon*, the half-tone will be fully preserved."

Fuming Dry Plates.—F. R. Scarlett, of Peshawur, states in the 'Bengal Photographic Journal,' that tannin and honey plates, fumed with ammonia before exposure, give him a good negative in forty seconds; the same plates, without the fuming, requiring five minutes' exposure.

Double Salt of Silver and Lead in Photography.—The Paris correspondent of a contemporary says that M. Grüne has produced some positives taken with the double oxide of silver and lead, and they prove that the great question of suppressing nitrate of silver in printing has become nearly solved. M. Grüne has already arrived at a minimum which is far from being devoid of interest. His process rests upon Wöhler's discovery, that, if we precipitate a mixed solution of a salt of lead and a salt of silver by potassa, a yellow precipitate is formed, which is a true alloy of the oxide of the two metals, the excess of potassa not being in a state to react upon the salt of lead, which is but slightly soluble in this reagent. This alloy, consisting of 66 parts of oxide of lead and 34 parts of oxide of silver, is sensitive to the action of light. The paper to which it is applied is printed as rapidly as paper coated with chloride of silver: it yields the most delicate half-tones, and the fixing and toning are effected in the ordinary manner.

In the first experiments a mixture of two parts of nitrate of lead and 1 part of nitrate of silver was precipitated by potassa: the precipitate was then washed and spread with a pencil upon unprepared paper, which, dried and exposed, passed in colour from yellow to black, in the exposed parts. Since the process has been modified, ordinary paper is placed on a bath composed of

Nitrate of lead	2½ parts.
Nitrate of silver	1 part.
Water	20 parts.

When dried, the paper is floated a second time upon a bath composed of 1 part of potassa dissolved in 30 parts of water.

The paper, now become yellow-brown, is dried, and then exposed, when the lights become brownish, but they return to a pure white after fixing by means of hyposulphite of soda. The proofs tone in the gold bath exactly like those upon albuminized paper.

By employing a dilute solution of 1 part nitrate of silver, 2 parts nitrate of lead, and 50 parts water, we also obtain very passable impressions.

The pictures have the brownish hue of most of the proofs obtained with pure nitrate of silver, but are less brilliant.

Magnesium Light.—M. Gaudin, who has been experimenting with the magnesium wire, for securing a very intense light, says that, besides its photographic value, it will have many other very important uses. He remarks, in 'La Lumière'—"The other applications of the magnesium light consist in the production of a very intense luminous point in the focus of a parabolic reflector, moving freely so as to convey signals to a distance, or for illuminating a glacis during siege-operations. From the moment that the problem of the fixity of the luminous point is solved, these two applications will be accomplished. It has been ascertained from experiments made in the harbour of Toulon, that a luminous point as large as a pea, giving only as much light as ten candles, radiating from the focus of a parabolic reflector as large as a hat, will illuminate a space of 10 metres at a distance of 1500 metres sufficiently to enable the smallest print to be easily read; and when it is desired to exhibit it as a lanthorn only, its intensity is equal to the light of a first-class lighthouse. With a fixed luminous point, this apparatus will become an excellent means for making signals both on land and at sea.

"With a magnesium wire arranged for burning, we can always, without preparation or apparatus for gas or electricity, easily produce a light equal to 100 or even 300 candles during ten seconds, which, with a reflector of ten inches in diameter, will cause everything passing at 2000 metres in advance to be seen very distinctly. And this will be the practical and the economical side; for a dozen of light-producing apparatus for gas or electricity, besides the encumbrance of transporting, and the getting to work, will cost at least 5000 francs, and with 5000 francs we could obtain, by employing magnesium wire at 100 francs the kilogramme, the means of producing many signals; and at this price it will figure largely in military pyrotechnics."

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

Pastime (*Cape Town*).—Your difficulties are not readily accounted for without knowing more of your mode of manipulation. The markings in one instance indicate an unclean plate, and the wave-like marks in the other an unevenness in the drying of the plate. If your plates have been placed promiscuously in a horizontal and vertical position to dry, and the process of drying has been accelerated or retarded in its action either by drafts of air or varieties of temperature, the appearances in the developed dry plates are fully accounted for. You should also use pure water in the preparation of the plates, in washing, and not a hard water, which may have been a cause to produce such streaks and waves as appear in these finished proofs.

Amateur.—Ground blue glass for the roof of your sitting-room is quite needless; and we believe no advantage can accrue to compensate for the increased expense.

J. H.—Many thanks for your consideration. The best paper for the prints of enlarged positives is machine-made drawing-paper, either Toogood's or Hollingworth's. An approved formula for the preparing of the paper has been recommended, with chlorine and bromine, developed with gallic acid; but if we were about to operate, certainly we should expect to obtain the best results by using the iodized paper as recommended for taking calotype negatives, a good formula for which you will find in the Journal, page 130, vol. i. The paper is exceedingly sensitive; and if not over exposed, a perfectly permanent black picture is produced,—too long an exposure giving a greenish, or, with extreme exposure, a red picture.

Amateur (2).—After you have filtered the bath, place the bottle in sunshine for a few hours without a stopper. A black granular deposit will in all probability take place. Also any ether or spirit absorbed from the collodion is liberated, giving off a peculiar wine-like smell. Baths charged with ether seldom act as they ought.

T. H.—If you have good rain- or river-water for your developing-solutions, it answers perfectly well; but hard water from a pump or well is very objectionable, and such deposits as you complain of are often produced by this cause alone.

Letters of inquiry to the Editor can be answered only through the medium of Answers to Correspondents.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 149. SEPTEMBER 15, 1864.

THE interregnum occurring between the close of one Session of the Photographic Society and the commencement of another is not usually regarded as a period fraught with much photographic interest. The discussion of theories and the institution of experiments are generally abandoned for practical work in the studio or the field. Modifying the old adage, the photographer takes negatives whilst the sun shines. The past few months have, however, been more prolific of matters of general photographic interest than the summer months have usually been; we propose, therefore, to glance at two or three subjects which have claimed attention.

The carbon process of Mr. Swan, which was brought before our April Meeting, has not only absorbed a good deal of public interest itself, but has called general attention to the subject, and stimulated experiment, thus giving rise to a number of modified processes. Mr. Swan has completed his patent, as will be seen from the condensation of his specification which we publish on another page. It is probable that his modification of the process, in which paper is used instead of collodion, will be found the most simple and efficient method of producing carbon prints; but how far the operation can compete with silver printing in cheapness and rapidity can only be determined by actual experiments on a large scale. The modified process may be thus briefly described:—A solution of gelatine is coloured by the addition of indian ink or lampblack, and some other pigments, such as crimson lake and indigo, to modify the tone. This is applied to sheets of paper, and dried. When required for use, the paper is floated, gelatine side down, on a solution of bichromate of potash for a few moments, much in the same way in which albuminized paper is rendered sensitive on the nitrate-of-silver bath. When dry, the paper is printed under a negative, the prepared side being in contact. The object is now to wash away all the gelatine, colour, &c., which have not been acted upon by light; but these are at the opposite side of the film, and in contact with the paper. The print is therefore mounted, gelatine side down, on to fresh paper, with some material which will be insoluble in water. This done, the whole is plunged in warm water; and the gelatine which is not rendered insoluble being quickly softened, the original paper on which it had rested is released and floats off, whilst the coating remains attached by the insoluble cement to the paper on which it was last mounted, and is there developed. This appears simple enough, and we see no reason why the operation should not be easy and cheap. If so, the beauty and permanency of the pictures must ensure for them considerable popularity.

Mr. Swan has not made any public announcement yet of the terms on which he intends to permit the public to practise his process; but we see it stated in a contemporary that it is probable he will place no restriction upon it, beyond reserving to himself the right to manufacture the prepared paper, obtaining his profit from that source. If this be done on anything like reasonable terms, we are disposed to think that such a course will secure to him a greater amount of popularity and remuneration than he would be likely to obtain by any other means, as, from long immunity from such charges, photographers would probably be very impatient of anything like a licensing or taxing system, whether the claim were just or unjust in itself.

The impatience to which we have just referred has been exemplified in the discussion which has just been raging in some of our contemporaries regarding the validity of a patent for a certain arrangement of blinds for glass rooms. These blinds consist of a series of strips of wood or other material, to be hung from the roof, or attached to the side windows in such manner as to prevent the admission of direct sunshine, without obstructing much light. They appear to consist, in fact, of gigantic Venetian blinds. How far the adaptation of a modification of the Venetian-blind system to the regulation of the light in a photographic studio would be the legitimate subject of a patent we cannot say. The patentee seems to have acted with perfect *bona fides*, and to have believed in the legitimacy of his claim. So far as we can glean the merits of the case from the published facts, we are inclined to doubt the general usefulness of the system, as well as the right to restrict its application by patent.

The old experiment, of endeavouring to produce negatives without the use of a nitrate bath, has once more cropped out, but this time in producing dry plates instead of plates for immediate exposure as in the wet process. A contemporary contains a communication, in which it is stated that a collodion containing three grains of bromide and four grains of nitrate of silver gives, with the tannin-process treatment, good negatives. A plate is coated, washed, covered with a fifteen-grain tannin solution, and dried. After exposure, the alkaline method of development is adopted, and the result is described as a good negative. The experiment is interesting, and, if, on further testing, it prove more successful than the partially satisfactory experiments which have often been made before in this direction, may prove useful.

Mr. Johnson, whose panoramic pictures were introduced to the Society some time ago, has been improving and simplifying his apparatus in detail, and has obtained complete success. He has produced a large series of very fine photographs, including considerably over 100°, excellent in quality, with natural clouds and well-arranged groups of figures. We hope to see some of them exhibited at the Society, when its Meetings recommence.

The French Photographic Society have just made an award of Medals to photographers who have distinguished themselves by contributing important aids to the advancement of the art. We are glad to record that, of the four medals awarded, two have been given to Englishmen, Major Russell receiving one for his labours in inventing and perfecting the tannin process, and Mr. Warren De la Rue another for his services to astronomical photography.

The Annual Exhibition in connexion with the Royal Cornwall Polytechnic Society is now open. In the award of Medals which has just taken place at this Exhibition, photography has been highly distinguished, six medals having been awarded to photographers. It will be gratifying to those who believe in the art-capabilities of photography, to find that at a Society like this, in which mere technical excellence or the conquering of manipulative difficulties would not be regarded as the chief sources of merit, Mr. H. P. Robinson takes the first prize for his composition "Autumn," and his charming landscape with sheep, "A Warwickshire Lane." The other medals were awarded as follows: — Second silver medal, Vernon Heath; first bronze medal, F. H. Morgan, Bristol; second bronze medal, R. H. Yeo, Plymouth; second bronze medal, W. Brooks, Penzance; second bronze medal, H. Cox.

The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors.

No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith. The same proviso extends to communications to the Editor.

Hints on the Use of Stops. By G. Wharton Simpson.

[From the 'Photographic News.']

A PERFECT knowledge of the operation of stops or diaphragms in photographic lenses, and an apt judgment in putting that knowledge into use, constitute one of the most important qualifications of a successful photographer; the subject is nevertheless one upon which the most limited, if not also the most erroneous, ideas prevail amongst a very large number of photographers. We propose here to state a few facts, and offer a few practical hints on the subject, without entering into the optical considerations upon which it is based—questions which, if entered into fully without a certain acquaintance with optical matters on the part of the reader, might tend to confuse, rather than enlighten, the unscientific student.

Stops are always used as corrective of some defect or shortcoming*; and it may be stated broadly, that they perform two distinct functions. By their position they affect the incidence of the pencils of light upon the lens, and thus modify the shape or character of the image, as regards distortion; and by the diameter of their aperture they regulate the size of the pencils of light, and thus modify the character of the definition.

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* This shortcoming may not be a defect *per se*, but an incapacity to fulfil all the requirements of pictorial art in photography.

THE SINGLE VIEW-LENS.—Let us consider first the *Position of the Stop*.

In the ordinary single view-lens, which is either of plano-convex or slightly meniscus form, its plane or concave surface placed frontwise, the stop is, of course, always placed in front of the lens; and the character of the image is materially modified by the distance at which the stop is placed from the anterior surface. A somewhat unsatisfactory rule has at times been stated as an approximate guide in placing the stop, to the effect that it should occupy a position in front equal to the diameter of the lens; but as lenses of the same focus vary considerably in diameter, a more satisfactory rule is based rather on the focus of the lens than its diameter, and it may be stated generally that the balance of advantages in regard to the view-lens, as commonly made, is found in placing the stop at a distance in front of about one-fifth of the focus of the lens: thus, in a stereo lens of five inches focus the position of the stop would be one inch from the interior surface of the lens.

The approach of the stop nearer to the lens increases the area of illumination, it decreases the barrel-shaped distortion, increases the curvature of field, and renders the marginal definition less perfect, the last defect being a natural result of the preceding one. By increasing the circle of illumination, it will be seen that it permits a larger angle of subject to be included in the picture, provided the scene is one in which the defects involved are unimportant. In interiors, for instance, the subjects are generally such as are improved, rather than injured, by the curved field, and, the upright lines being rendered straighter, a balance of advantages is gained by the stop being placed a little nearer to the lens,—sometimes also in street-scenes, lane-scenes, and some landscapes, especially where the subject will admit of vignetting, so as to gain the effect of wide angle and conceal imperfect marginal definition by the gradation of tint in the edges. On the other hand, where a moderately flat field is important, and where it is important to secure good definition throughout, a loss, rather than a gain, results from removing the stop nearer to the lens.

Removing the stop further from the lens decreases the field of illumination, flattens the field, improves the marginal definition, tends to equalize the illumination all over the field, but slightly increases the distortion or curvature of lines. Where uniform and good definition is more important than a wide angle, and where a flat field is imperative, as in copying, the removal of the stop to a due distance from the lens will give the best result. Probably, as a general rule, it will be found that the stop should never approach nearer to the lens, as usually made, than one-sixth of the focal length, or be removed further from it than one-fourth.

The Size of the Aperture chiefly affects the character of the definition. The full aperture of a view-lens cannot be used in producing a photograph. From the imperfect correction due to the necessary form and position of the lens, the definition of the image and curvature of the field would be intolerable. In proportion as the marginal rays are cut off and the pencil of light attenuated by the reduction of the aperture, the definition is improved both in quality and depth. A very little reflection, even by the unscientific reader, will render this apparent. The more acute the angle formed by the cone of rays passing through the lens, the more attenuated and prolonged its point will be, and the more delicate the definition, not merely on one plane, but through several planes, and thus *depth of focus*, as well as crisp definition, are secured. To use a physical illustration, the large aperture gives a result like a lead pencil with a blunt broad point, with which it is impossible to produce a fine line, whilst the small stop brings the pencil to a fine point, and permits of the finest and most delicate delineation.

But there are limits to the advantage gained by reducing the size of the stop. In the first place, the loss of light and consequent prolongation of exposure are in the direct ratio of the reduction of the aperture. The rapidity of a lens depends mainly upon its angular aperture, or the relation of the aperture to the focus. The larger the aperture and the shorter the focus, other things being equal, the more rapid will be the action; and the smaller the aperture the longer will be the exposure. An aperture or stop of half an inch diameter admits only one-fourth the amount of light admitted by a stop of one inch diameter, and will require an exposure four times as long. A stop of a quarter of an inch diameter only admits one-sixteenth of the light which a stop of one inch admits, and will require sixteen times as long exposure as the one-inch stop; one-eighth of an inch sixty-four times as long, and so on, the increase of the exposure being in direct ratio to the decrease of the aperture. In practice there are at times circumstances of photogenic action which very slightly modify these relations of time to aperture, but not sufficiently to affect the general question. Reduction in the amount of light, moreover, not only prolongs the time of exposure, but frequently renders it difficult to obtain sufficient intensity of the image.

Besides the loss of light consequent upon using a very small stop, there is another evil which is too frequently lost sight of. When the aperture is reduced to a minimum, there is a considerable loss of relief in the image. If the aperture of a microscope-objective be reduced too much, there is a loss of separation, as it is termed. With the photographic lens stopped down unduly, there is a loss of vigour, relief, separation of parts, and effect of distance. The picture is distinguished by what an artist would term *adhesiveness:* everything is compressed together and dwindled, and a general map-like effect is produced, instead of a picture having relief and distance. Thus, whilst the stop is valuable in improving definition as definition, it is destructive of artistic qualities, if reduced beyond what is absolutely necessary in securing a certain amount of sharpness. The small stop improves definition; the large stop gives relief; and the happy medium must be attained by preserving a due relation between the size of the stop, the focus of the lens, and the character of the subject. For a reproduction or flat surface, where no relief exists in the subject, and fine definition is required, there need be no limits to the size of the stop, except those imposed by loss of light and the danger of aberration from diffraction; but for objects in relief, judgment must be used to secure a balance of advantages.

Stating the question generally, the largest stop which should be used with view-lenses of short focus, say of from four inches focus to ten inches focus, should not exceed from one-tenth to one-fifteenth of their focal length; whilst for the larger single lenses, which are generally less perfectly corrected than smaller ones, the aperture should not exceed one-twentieth of their focal length. The aperture should be reduced beyond this in many cases, and to such degree as circumstances will permit, taking care not to reduce it so much as to render the view flat, adhesive, and insignificant.

Depth of Focus, or the sufficient definition of objects on several planes of distance, is only secured by the use of small stops. But it should be remembered that all objects, beyond a certain plane and thence to infinity, are sufficiently defined. It is only the different planes near to the lens which are palpably out of focus at any time. It has been calculated that with an aperture of one-fortieth of the focal length, all objects beyond four feet from the lens would be in focus, with a lens of one inch focus, and so on, reckoning four feet for every inch of focus. Thus, with a lens of five inches focus, and one-eighth stop, all objects beyond twenty feet and thence to infinity would be in sufficient focus. With a large aperture, the distance beyond which everything would be in focus would be a little greater. But it will be seen that where rapid or instantaneous exposures are required, sufficient depth of focus can be secured by using care not to include very near foreground objects, but to focus for an object at a distance of something more than four times the number of feet which the focus of the lens is of inches.

In focusing, the use of a very small stop sometimes diminishes the amount of illumination so seriously, that it is difficult to see whether the utmost possible sharpness has been obtained. On the other hand, if the image be focused with a large aperture, and a smaller stop then substituted for the large one, another risk is incurred. At first sight, it might be argued that, as the use of a smaller stop always improves definition, it would be quite safe to get the image as sharp as possible with a large stop, and then reduce the aperture still more. This is true to a certain extent; but it also happens that the use of a smaller stop has the effect of lengthening the focus a little, and thus throwing the image a little further from the lens; so that if the focus were taken with full aperture and a very small stop then introduced, much of the advantage of improved definition would be rendered nugatory. Perhaps the best plan is to focus with the smallest aperture which admits sufficient light to render that operation certain, and then, if necessary, substitute a smaller stop which will not make a perceptible difference in lengthening the focus.

COMPOUND OR PORTRAIT-LENSES.—Many of the facts relating to single lenses are true of compound lenses; but, in some respects, essentially different rules obtain. With the portrait-lens, as with the view-lens, the stop is used to correct defects: by its position it modifies the character of the image and the curvature of the field, and by its size it modifies the character of the definition. But, whilst in a single lens the stop is absolutely necessary to correct spherical aberration, in the compound lens it is possible to approximate closely to absolute correction and obtain a perfect focus on a single plane, so that a stop is not necessary to improve the definition in that plane. The effect of the stop on the definition of a perfectly corrected compound lens is to extend it more evenly over a flat plate, and to increase its depth of definition, bringing into satisfactory focus objects placed at different distances from the lens.

The Position of the Stop is generally between the front and back lenses of the combination. The advantages of this position are various. If the form of the lenses be that usually employed, and the stop be placed at a point between the front and back lens, the distance from each being proportionate to their foci, the image will be free from distortion. Suppose, for instance, the front lens of a portrait combination have a focus of six inches, and the back lens a focus of twelve inches, and the amount of separation between the lenses be one inch and a half, then the position of the stop must be, in order to prevent distortion, half an inch from the front lens and an inch from the back lens, the distance in front and behind the stop having the same relation as the foci of the respective lenses. This is the best position for the stop, in order to prevent distortion, and it also secures a maximum of some of the other advantages of a stop, with the least loss of light. But it is not necessarily the best position for securing all other qualities. If flatness of field be the aim, it will be better secured by placing the stop nearer to the front lens, and best of all by placing it in contact with the anterior surface of the front lens.

At first sight this last statement will appear to some readers to be an anomaly. We have already stated that approaching the stop to the front surface of the single lens increases the curvature of the field, and increases the area of illumination. We now state that bringing the stop into contact with front surface of a compound lens flattens the field, and decreases the area of illumination. The operation is really the same in both cases, but the conditions are different where two lenses are thus employed. The reader will more readily understand the real action by regarding for a moment the back lens of the combination as the equivalent of the single lens. It will then be seen that as the stop is removed further from it, the field is flattened, and the area of illumination circumscribed as in the single lens. The time of exposure is of course more prolonged by a stop in this position than by one of the same aperture between the lenses. Placed here it practically circumscribes the acting portion of the front lens, and relatively increases the acting power of the back lens, and this has the effect of flattening the field.

The presence of the stop in front of the lens also serves another very important purpose, besides flattening the field. When double combinations are used for landscape-purpose, and are pointed towards the light, having at the same time a small central stop, a foggy spot of light is often seen in the centre of the field, which is very tantalizing and annoying. This is often caused by reflections from the front lens. The remedy generally proposed, in the shape of a black annulus on the posterior surface of the front lens, only proves partially successful. From a recent more careful examination of the subject, we ascertain that a certain remedy is the use of a stop in contact with the front lens. This prevents the reflections in question, and proves a certain remedy.

Where rapidity of action and at the same time the maximum of correction, both as regards distortion and definition, are required, a central stop will give the best result. But where a flat field, as in copying, or in standing figures, or with some architectural subjects, is required, or where, in landscape-work, the lens is pointed towards the light, and there is danger of producing a central spot of light, and where a slight curtailment of the field is not an objection, then the stop in contact with the front lens, either alone or in combination with a central stop, will be found to give the best result. Perhaps the best plan in such a case is to commence by using a front stop, as small as the nature of the case will permit. It will be found, however, that reducing the size of the aperture in a front stop circumscribes the field more and more as the aperture is made smaller. When, therefore, it is found that the limits of the field do not permit of further reduction of the front stop, then a central stop of a still smaller aperture may be inserted to obtain further correction, and also to secure freedom from distortion.

The Size of the Stop will be regulated by the same conditions, already adverted to, as govern its size with the single lens. The reduction of aperture here, as in the single lens, improves imperfect definition. With a perfectly corrected lens, it does not improve the definition, which is already good on a single plane, but it increases the depth of that definition, or makes it include a greater number of planes. It also equalizes it over a flat field, thus improving the marginal definition. If the lens be imperfectly corrected, it improves the whole quality of the definition by attenuating the pencils, and practically giving them a fine point, instead of a blunt one, with which to do their work.

The Depth of Definition is of course affected by the same cause, and in like manner. If the subject be a large head in portraiture, the stop will bring the tips of the ears and the nose into focus at the same time, which, if the lens were a perfectly corrected one, having a good focus only in one plane, would, with a large angular aperture, have been hopelessly out of focus. With a similar lens the accessories and background of a card picture would be out of focus, and the stop would be required to render them with tolerable definition; and to secure anything like modelling in the large head, or avoid imperfect definition in all but a small piece in the middle of a card picture, the reduction of the aperture will be necessary in what is regarded as a perfectly corrected lens; whilst if the lens be imperfectly corrected, the stop will be required to get crispness of definition, and avoid fuzziness.

The undue reduction of the aperture has, however, the same objections here as in the case of the single lens. The loss of light is in the direct ratio of the reduction of aperture, the increase in the time of exposure being the square of the decrease of aperture. This, in portraiture, is a serious detriment, as rapidity of action is the main element in securing good expression. Undue reduction of aperture, moreover, has the same tendency to destroy relief and boldness, giving a flat effect to the picture, however well lighted and defined. This is largely destructive of the art-qualities of a picture. These considerations bring us to a very important question, which has doubtless occurred to some of our less experienced readers. We have been speaking of the effect of stops in producing the various qualities which photographers require in a lens. We have referred to their action in correcting distortion, in flattening the field, in equalizing illumination, in improving marginal definition, in giving crispness of definition, in giving depth of focus. If these results are brought about by the use of stops, what, it may naturally be asked, is the difference between a good and a bad lens? And what is the object of giving a high price for the instrument of a skilled optician, rather than a low price for one made by nobody knows whom?

We stated at the outset that the action of stops was always corrective—always intended to remove some defect. If the photographer be content to use a sufficiently small stop, and to adapt his subject to the requirements of his lens, he may secure a moderately good picture with almost any kind of lens. A small aperture in the right place is a wonderful corrective. But, for every advantage gained, there is, as we have explained, something lost: the exposure is prolonged, and relief is destroyed; and with a bad lens, the aperture must be so small as to bring about the maximum of these disadvantages. The more perfectly corrected the lens, the larger the aperture with which it may be worked for securing perfect definition, and hence the more rapid it will be in action, and the more bold and relieved its images.

Let it be distinctly understood, then, as we stated at the outset, that the use of stops is a valuable power in the hands of the photographer for correcting certain shortcomings in a lens, but that the best lens is that which will give the best results with the largest stop, and that the highest skilled optician is he who constructs a lens which gives the best pictorial definition with the largest aperture, and which does its work with the shortest exposure.

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Mr. Swan's Patent Carbon Process.

Mr. Swan's patent for the carbon process described at the April Meeting of the Society, and published in our pages in that month, was sealed on the 27th ult. The specification is a somewhat lengthy document; but it will only be necessary to make some extracts from it to enable our readers to understand the points claimed. After explaining the principle upon which the obtaining of half-tone in carbon prints depends, namely the exposure and printing on one side of a prepared surface and then developing or washing away the unaltered material from the other, it proceeds as follows:—

"Now, my invention consists in the formation of tissues adapted to the manner of printing referred to, and composed of, or prepared with, coloured gelatinous matter, and so constructed that, while they allow in the act of printing free access of light to one surface of the coloured gelatinous matter, they also allow free access of water, and the unobstructed removal of the non-affected portions of the coloured matter from the opposite surface, or back, in the act of developing; and I obtain this result either by the disuse of paper altogether, or by the use of it merely as a backing or temporary support of the coloured gelatinous matter, the paper so used becoming entirely detached from the coloured gelatinous matter in the act of developing, and forming no part of the print ultimately.

"My invention consists, furthermore, in the special mode of using the said tissues, whereby superior half-tone and definition in the print are obtained as aforesaid, and also of a mode of transferring the print after developing from a temporary to a permanent support, so as to obtain a correction in the position of the print in respect of right and left. In producing the photographic tissues referred to I form a solution of gelatine, and for the purpose of imparting pliancy to the resulting tissue I have found it advisable to add to the gelatine solution sugar or other saccharine matter, or glycerine. To the said gelatinous solution I add carbonaceous or other colouring matter, either in a fine state of division, such as is used in water-colour painting, or in the state of a solution or dye, or partly in a fine state of division, and partly in solution.

"With this coloured gelatinous solution I form sheets or films, as hereafter described; and I render such sheets or films sensitive to light, either at the time of their formation, by introducing into the gelatinous compound bichromate ammonia, or other photographic agent of like photographic properties, or by applying to such non-sensitive sheets or films after their formation a solution of the bichromate or other substance of like photographic property. This latter method I adopt when the sheet or film is not required for use immediately after its formation."

The specification then proceeds to describe the formation of tissues with gelatine, pigment, and collodion, as described in our April Number. It will be seen there is, however, an allusion to paper in the place of collodion, and to rendering the tissue sensitive by floating on a solution of bichromate instead of adding the salt to the gelatine at the time of preparation.

This modification of the process is thus described:—Having coated a plate of glass with the mixture of gelatine and pigment, without bichromate, he says—

"Before the separation of the coating from the glass, I attach to the coating a sheet of paper for the purpose of strengthening the tissue, and making it more easy to manipulate. I generally apply the paper in a wet state to the dry gelatinous surface; and having attached the paper thereto in this manner, I allow it to dry, and I then detach the film and adherent paper from the glass, by cutting around the margin of the sheet, and lifting it off as before described. Where extreme smoothness of surface, such as is produced by moulding the tissue on glass as described, is not of importance, and where greater facility of operation is desired, I apply a thick coating of the tissue-compound to the surface of a sheet of paper. In this case the paper is merely used as a means of forming and supporting temporarily the film produced from the tissue-compound; and such paper separates from the gelatinous coating in a subsequent stage of my process. In coating a surface of paper with the sensitive-tissue compound, I apply the sheet, sometimes of considerable length, to the surface of the tissue-compound contained in a trough, and kept fluid by means of heat, and I draw or raise the sheet or length of paper off the surface with a regular motion, and I sometimes apply more than one coating to the same sheet in this manner. After such coating, I place the coated paper where it will quickly dry, and seclude it from injurious light.

"The non-sensitive tissue is made sensitive when required for use by floating the gelatinous surface upon a solution of the sensitizer; and the sensitizer that I prefer to use for this purpose is an aqueous solution of the bichromate of potash containing about two and a half per cent. of this salt. I apply the sensitizer, by floating or otherwise, to the gelatinous surface of the tissue, and after this I place it in a suitable position for drying, and exclude it from injurious light."

If the tissue, with collodion, as originally described, be used, the collodion side is placed in contact with the negative, and the same side is placed in contact with the paper on which it is mounted prior to development. If the prepared paper be used, the gelatine side is placed in contact with the negative, and also in contact with the paper on which it is next mounted prior to development. In the latter case the whole is then immersed in warm water, which quickly removes the paper on which the gelatine and pigment rested at first. Leaving it on the paper, it is newly mounted, with its opposite ready for development. On this subject the specification says:—

"In mounting the exposed tissue or paper (previous to development) in the temporary manner, with a view to subsequent transfer to another surface, I employ in the mounting a cement that is insoluble in the water used in the developing operation, but that can be dissolved afterwards by the application of a suitable solvent, or one that possesses so little tenacity that the paper or other support attached temporarily to the tissue or paper by its means may be subsequently detached without the use of a solvent.

"The cements that may be used for temporary mounting are very various, but I generally prefer to use a solution of india rubber, in benzole or other solvent, containing about six grains of india rubber in each ounce of the solvent; and I sometimes add to the india-rubber solution a small proportion of dammar gum or gutta percha. In using this cement I float the photographically impressed surface of the tissue upon it, and I treat in a similar manner the paper or other surface intended to be used as the temporary mount or support during development; and after allowing the benzole or other solvent to evaporate, and while the surfaces coated with the cement are still tacky, I press them strongly together in such a manner as to cause them to cohere.

"When the photographically impressed but still undeveloped tissue is to be cemented to a surface that not only serves to support the picture during its development, but also constitutes permanently the basis of the picture, I prefer to use albumen or starch paste as the cementing medium; and where I employ albumen, I coagulate or render it insoluble in water (by means of heat, by alcohol, or other means), after performing the cementing operation, and previous to developing. In the permanent as in the temporary mode of mounting, I cement the tissue *with its photographically impressed surface downward*, upon the surface to which it is to be permanently attached. After mounting the tissue, as before described, and allowing the cement used time to dry, where it is of such a nature as to require it, I then submit the mounted tissue to the action of water sufficiently heated to cause the solution and removal of those portions of the coloured gelatinous matter of the tissue which have not been rendered insoluble by the action of light during exposure in the printing-frame or camera. Where paper has been used as a part of the original tissue, this paper soon becomes detached by the action of the warm water, which then has free access to the under stratum, or back of the coloured gelatinous coating, and the soluble portions of it are therefore readily removed by the action of the water, and by this means the impression is developed that was produced by the action of light during the exposure of the tissue in the printing-frame or camera, and the picture remains attached to the mount cemented to the photographically impressed surface previous to development."

The developed print, having been completely washed, is now complete, it is dried, and is dealt with according to the subject, and whether it have to remain on the paper on which it was developed or be intended for transfer. The specification says:—

"Those not intended for transfer, but that have been permanently attached to paper previous to development, I finish by pressing and trimming in the usual manner. Those which have been temporarily mounted I transfer to paper, card, or other surface. In transferring to paper or card, I coat the surface of the print with gelatine, gum arabic, or other cement of similar character, and allow it to dry. I then trim the print to the proper shape and size, and place its surface in contact with the piece of paper or card to which the transfer is to be effected, such piece of paper or card having been previously moistened with water, and I press the print, and mount strongly together; and after the paper or card has become perfectly dry, I remove the paper or other supporting material temporarily attached previous to development, either by simply tearing it off, where the cement used in the temporary mounting is of a nature to allow of this without injury to the print, or I apply to the temporary mount benzole, or turpentine, or other solvent of the cement employed, or I immerse the print in such solvent, and then detach the temporary mount, and so expose the reverse surface of the print; and after removing from the surface of the print, by means of a suitable solvent, any remains of the cement used in the temporary mounting, I finish the print by pressing in the usual manner. If, however, the print be collodionized, and be required to be tinted with water-colour, I prefer to remove the collodion-film from the surface of the print, and this I do by the application of ether and alcohol."

The details of manipulations, materials, and proportions used, are so similar to those given in Mr. Swan's original paper, that we need not further enter into the matter here. We glean that the especial points claimed as patent refer rather to the mode of working than to the materials employed. The final claims are thus stated in the specification:—

"I wish it to be understood that, under the above in part recited letters patent, I claim:—First, the preparation and use of coloured gelatinous tissues in the manner and for the purpose above described.

"Secondly, the mounting of undeveloped prints obtained by the use of coloured gelatinous tissues, in the manner and for the purpose above described.

"Thirdly, the remounting or transference of developed prints produced as above described, from a temporary to a permanent support."

AMATEUR PHOTOGRAPHIC ASSOCIATION.

Award of Prizes.

A Council Meeting was held, August 12, at 12 York Place, Portman Square, Major Russell in the Chair.

The Minutes of the last Meeting having been read and confirmed, Mr. Glaisher read the report of the Referees respecting the relative excellence of the pictures, of which the following is an abstract.

There were forty-eight pictures of the highest Class (prizes not included), contributed as follows:—J. W. Rimington, Esq., 10; Dr. Hemphill, 6; Col. Holder, 5; W. D. Chidson, Esq., 5; Capt. Bankart, 5; the Hon. W. W. Vernon, 3; F. Beasley, Esq., 3; Major Gresley, 2; Capt. Hutton, 2; B. Jones, Esq., 2; G. Bevington, Esq., 1; F. E. Currey, Esq., 1; F. H. Lloyd, Esq., and W. D. Howard, Esq., 1; G. S. Penny, Esq., 1; Capt. W. H. Mason, 1.

In Class 2 there were one hundred and ten pictures, contributed as follows:—J. W. Rimington, Esq., 20; Sir J. J. Coghill, 7; the Hon. W. W. Vernon, 5; Col. Holder, 5; Capt. Bankart, 5; J. A. Melany, Esq., 5; C. A. Baylay, Esq., 4; A. Suzanne, Esq., 4; Capt. Bonamy, 4; Capt. W. H. Mason, 4; Dr. Hemphill, 3; Rev. F. Gutteres, 3; J. C. Arkwright, Esq., 3; Major Gresley, 3; Capt. Hutton, 3; G. Bevington, Esq., 3; F. E. Currey, Esq., 3; Sir M. Cave, 2; J. S. K. Moss, Esq., 2; F. Beasley, Esq., 2; Lieut.-Col. de Ros, 2; H. St. Vincent Ames, Esq., 2; J. A. Rolls, Esq., 2; F. H. Lloyd and W. D. Howard, Esqs., 2; W. D. Chidson, Esq., 2; the Countess of Rosse, 1; J. A. C. Branfill, Esq., 1; J. A. Silk, Esq., 1; G. S. Penny, Esq., 1; B. Jones, Esq., 1; Hon. R. Abercromby, 1; Rev. W. S. Meade, 1; Miss Louisa Ramsden, 1; R. Staples, Esq., 1; Hon. and Rev. A. Campbell, 1.

In Class 3 there were one hundred and thirty-two pictures, contributed as follows:—J. W. Rimington, Esq., 35; the Hon. W. W. Vernon, 9; Capt. Bankart, 9; Rev. F. E. Gutteres, 7; J. A. Melany, Esq., 5; F. H. Lloyd, Esq., and W. D. Howard, Esq., 6; G. Bevington, Esq., 4; G. S. Penny, Esq., 4; F. Beasley, Esq., 4; J. Rivington, Esq., 4; Major Gresley, 3; Hon. R. Abercromby, 3; H. St. Vincent Ames, Esq., 3; Lieut.-Col. D. F. de Ros, 3; Col. Holder, 3; J. A. C. Brunfill, Esq., 3; Sir J. J. Coghill, 2; St. John Coventry, Esq., 2; A. Suzanne, Esq., 2; C. A. Baylay, Esq., 2; B. Jones, Esq., 2; Dr. Hemphill, 2; Capt. W. H. Mason, 2; F. E. Currey, Esq., 2; H. Wood, Esq., 2; Sir T. M. Wilson, 2; J. A. Silk, Esq., 1; Rev. T. Hervey, 1; Sir M. Cave, 1; J. S. K. Moss, Esq., 1; S. Mortimer, Esq., 1; Miss L. Ramsden, 1; J. C. Arkwright, Esq., 1.

Class 4 comprises a very large number of excellent pictures, in which as contributors may be noticed the Rev. G. Egerton, Mrs. S. Harris, the Rev. J. Williams, F. H. N. Glossop, Esq., and others.

Scarcely so many stereoscopic pictures have been contributed this year as last; but the improvement in quality is very considerable. First amongst the contributors of stereo pictures is C. A. Halford, Esq.: his instantaneous pictures and interiors are exceedingly fine. Next to him ranks Capt. Mason, who has sent some very interesting Indian subjects. Some very good stereos have been exhibited by the following Members:—E. J. Lane, Esq., N. R. Cherrill, Esq., Dr. Maidstone Smith, R. B. Bowman, Esq., Rev. F. E. Gutteres, Walter Jeffreys, Esq., W. H. Cook, Esq., D. Laurie, Esq., Arthur Booty, Esq., J. W. Keeling, Esq., and T. Turpin, Esq.

In addition to these, an interesting series of micro-photographs has been sent by Drs. Wilson and Abercrombie.

The following prizes were awarded:—

Dr. W. D. Hemphill. Drawing Room at Newtoun Anner.

J. W. Rimington, Esq. Study of ferns and ivy.

Capt. Hutton. Caryatides, Athens.

G. Bevington, Esq. A pair of pictures: a Calm and a Storm.

E. R. Hall, Esq. Series of views at Oxford.

F. H. Lloyd, Esq., and W. D. Howard, Esq. Lac de Gaube.

Capt. Mason. Mahomedan Tombs at Hookeree Belgaum.

Stereo prizes:—1st, C. A. D. Halford, Esq. The Beach and Pier at Ventnor: instantaneous.

2nd, C. A. D. Halford, Esq. Interior: Drawing Room at Dytchley, the seat of Viscount Dillon.

Certificates of Honourable Mention were awarded to the following Members:—J. W. Rimington, Esq., the Hon. W. W. Vernon, Lieut.-Col. Holder, Capt. Bankart, Dr. Hemphill, Major Gresley, Capt. Mason, Capt. Hutton, W. D. Chidson, Esq., C. A. D. Halford, Esq., F. Beasley, Esq., Sir J. J. Coghill, Esq., J. A. Melany, Esq., A. Suzanne, Esq., Rev. F. E. Gutteres, F. H. Lloyd, Esq., W. D. Howard, Esq., G. Bevington, Esq., F. E. Currey, Esq. The Council would gladly have awarded prizes to several other Members, had the funds permitted. Amongst them may be mentioned as particularly deserving, the Hon. W. W. Vernon, Capt. Bankart, Major Gresley, Lieut.-Col. Holder, W. D. Chidson, Esq., and F. Beasley, Esq.

The Secretary was directed to mention in the report that the delay in awarding the prizes this year has been owing to the great difficulty the Council have experienced in arriving at a just and satisfactory decision, in consequence of the large number of first-class pictures from which the prizes had to be selected, the present being the third Meeting which had been convened for the purpose.

A. J. Melhuish, *Hon. Sec.*

MEMORANDA:

Photographic, Scientific, and Practical.

Reducing Silver from Solutions to a Metallic State.—MM. Davanne, in the course of researches in connexion with positive printing, recently presented to the French Photographic Society, make some suggestions as to the reduction of waste solutions, &c., by methods not commonly employed by photographers. Instead of obtaining the silver from waste hyposulphite solutions by means of liver of sulphur, as hitherto recommended, they prefer the use of copper for the purpose. Of the method of throwing down the silver as a sulphide, they observe:—"This process fixed the attention of operators from the first; many adopted it, and more than one rediscovered it, subsequent to its first publication. It is now practised in some laboratories, but its adoption is far from general. In fact, it presents many objections; the alkaline sulphides give out hydrosulphuric emanations in the operating-room, which are not only offensive and disagreeable, but also injurious to the stability of the proofs prepared in it. A large quantity of sulphur is precipitated with the sulphide of silver, which renders the subsequent operation of roasting delicate and unpleasant. If the roasting is incomplete, the mass retains a certain quantity of free sulphur, which, in presence of traces of carbon, which the ashes always contain, and of the nitre with which they are treated, may give rise to dangerous explosions.

"If, to avoid these inconveniences, we substitute for the liver of sulphur the monosulphides found in commerce among chemical products, we encounter the other inconvenience of operating with uncertain products, often richer in carbonate than in sulphide, and at other times containing an excess of sulphide. Still, with a certain amount of skill, it is easy to overcome these inconveniences, and the sulphide-process would still be recommended, if chemistry did not offer, as we shall show, much simpler methods."

They then, after reviewing the various other methods which have been proposed, proceed to describe the plan now recommended, which is as follows:—

"A plate of copper, left in the solution of nitrate of silver which constitutes the washings, precipitates the whole of the silver in the state of metallic sponge in four-and-twenty hours. A plate of zinc acts in the same manner.

"A plate of copper, left in the solution of hyposulphite of soda which constitutes the fixing bath, precipitates the silver in the form of a coherent powder, often even in a continuous plate, but with less rapidity; two days' contact are necessary, at least, and four days are better, but at the end of this time the action may be considered as terminated; prolonging it will be neither injurious nor advantageous. If the precipitate be longer in presence of the hyposulphite, it is not, moreover, so complete. About one-tenth of the silver remains in solution, but this loss may be neglected; it is very trifling, in fact, for the quantity of silver contained in the hyposulphite does not exceed 37 per cent. of the total quantity, which reduces the loss to 3·7 per cent. of this quantity.

"We perceive then, from every point of view, that there is an advantage in treating separately the washing-waters before toning, and the fixing solution.

"To this end the photographer must have, either within or without the operating-room, two earthen vessels of such dimensions that one may contain the washing-waters of two days, the other the fixing-solutions and their first washing-waters of four or six days. In each of these pots a number of plates of copper are placed; or two large plates placed opposite to each other answer very well. No suspension or particular precaution is necessary; the sheets of copper may simply rest against the sides of the vessel.

"In the course of his working, the photographer will throw the washings into the first pot, and allow them to remain twenty-four to forty-eight hours as required. Into the second pot he will throw the fixing-baths and the first washings, taking care to leave them for at least a couple of days to settle.

"In both vessels he will see metallic silver deposited upon the immersed portions of the plates of copper, which he will take care to remove from time to time with a hard brush. The silver powder may either be collected immediately or left at the bottom of the vessel until it has accumulated in sufficient quantity to be melted. In either case, the liquid must not be decanted until some minutes after brushing the plates, and when the silver powder shall have had time to be precipitated.

"The powder will be afterwards collected upon a paper or linen filter, if the quantity is considerable, then dried in the open air or in a stove or oven.

"It will now be ready for melting. This is an easy operation under present conditions, and the photographer can perform it himself; but if he prefers to avoid it, he can sell the metal precipitate to a refiner. The form under which the silver is precipitated is preferable to any other for this purpose, for it is quite easy to put this powder into the crucible and ascertain its value before the purchase is effected. By taking the precaution to assay the product before making a sale, all disputes are avoided. But if the photographer prefers to fuse the powder himself, he will proceed as follows:—He will place a good crucible in the furnace and make it red hot; and when this temperature is attained, he will throw in, little by little, the following mixture:—

Silver powder, washed and dried	100	parts.
Fused borax, pulverized	50	"
Fused nitre, pulverized	25	"

The object of the nitre is to oxidize most of the copper mixed mechanically with the silver while brushing the plates. When all ebullition has ceased in the crucible (the height of which must be such that it will contain at least three times the quantity of mixture put into it), the fire must be increased during twenty minutes, then left to cool, when the crucible must be broken to remove the metallic button. This will still contain a little copper, but that will be the only impurity with which it will be mixed. The photographer will encounter no further difficulty, either in converting it directly into nitrate, or in selling it to a refiner after being tested."

In dealing with solid residues, they recommend the following treatment:—"All the waste papers of the operating-room must be collected together, burnt in a clean furnace, and the ashes left in a heap to smoulder, in order to render the combustion of the organic matters complete.

"We then make the following mixture:—

Ashes	100 parts
Carbonate of soda, dry	50 „
Quartz sand..........	25 „

Thus mixed, the materials melt readily; even the chloride itself is reduced, and we may obtain a metallic button, the weight of which will vary from 30 to 60 per 100 of the weight of the ashes, according to the nature of the papers submitted to combustion.

"In conclusion, by following the method we have indicated, and applying it carefully, the photographer may always find in his residues 90 per 100 of the silver employed. In fact, the only loss or expense that he will have to incur, are:—

3·1 per 100 (about) remaining in the proof.

2·3 per 100 lost in draining.

3·7 per 100 (about) which the plates of copper will not have completely removed from the hyposulphite solutions.

"The reader will doubtless be surprised that we have not, in the course of this inquiry, spoken of the gold residues; but if he will refer to the chapter on Toning, he will recognize that with the gold bath acting in a continuous manner, as we have proposed, gold residues no longer exist. If, however, the photographer attached to the old methods of toning believes that he ought to throw among the residues every day the considerable quantity of gold still remaining in an inert bath, and which can be turned to account, he will not trouble himself about the matter. What we have stated about the silver applies also to gold. The plates of copper and zinc precipitate gold as well as silver, and both will be found in the powder precipitated or in the metallic button."

Photographic Ghosts.—A contemporary gives the following interesting experiment:—"If we take a negative (the larger the better) and place it in a window, with a piece of ground glass behind, and darken all the other panes but the one on which the negative is placed, and then look steadily at one particular part of it for, say, half a minute; on directing the eyes to the dimly illuminated ceiling of the room, we see there depicted a beautifully distinct positive of a rich sepia tint. The illusion is really astonishing, and forms a striking illustration of the persistency of vision. If this is shown to a person who is acquainted with the subject of the negative, he will not recognize his friend on looking at it, but on looking at the ceiling will have a perfect ghost of the person there presented to his vision. If the eyes are not kept on the same spot, a blurred vision will be the result. By looking closely at the negative, a large figure will appear, and *vice versâ*. By the aid of a magic lantern, this might be well shown to a large number of people."

Restoration of Cracked Films.—Some time ago considerable attention was called to the occasional cracking of varnished films, and a discussion was held at one of the Society's meetings on the subject. Shortly afterwards Mr. H. P. Nichols gave, in the 'Photographic News,' a method of restoring such films by submitting the negatives to the vapours of the spirit employed in making the varnish. The same journal contains, in a recent number, the confirmation of this remedy by Mr. Spiller, of the Royal Arsenal, Woolwich. He says:—"Your readers may be interested in being informed of a really efficient plan of restoring negatives the varnished films of which have become honeycombed and partially separated from the glass by the action of frost. A short time since, I had occasion to try experiments upon a few negatives which were injured by the cold and damp during the last winter, and have succeeded, by exposing them to the vapours of alcohol and ether, in causing the uplifted portions to return to their original position on the glass plate. In the present instances it was not even necessary to apply an extra coat of varnish, a precaution which would obviously aid in the preservation of thin and weak films. From the restored negatives we have been able to procure prints in which no sign of the injury sustained has been apparent; it seems impossible to eradicate all traces of the imperfections upon the negative itself; but these do not, however, leave any mark upon the print by which their existence could be discovered.

"The mode of working was simply to employ an ordinary glass shade in an inverted position, and having placed therein a mixture of three parts of methylated alcohol and one of ether, the injured negatives were introduced two at a time, and with their coated surfaces outwards, and the top covered with a glass plate. At the expiration of about twelve hours the collodion-films had completely subsided, and then required merely to be slightly warmed for the purpose of hardening the varnish. It does not appear that any disadvantage ensues as the result of leaving the film exposed to the alcohol vapour for a longer time than the period actually sufficient to effect the restoration, and I have never noticed any indication of the settlement of condensed liquid upon the plates; so that the film is not under any circumstances liable to slip or become separated."

Iodide in the Silver Bath.—Dr. Vogel contributes to a contemporary the results of some further experiments on the behaviour of iodide of silver in the silver bath. He gives the following numeric results of the analyses of several baths:—

1. *Baths free from Alcohol.*

a. The bath above mentioned, which was mixed with water until it became turbid, contained, in this state, at a temperature of 16° C.=60° F., in 100 cubic centimetres—

Nitrate of silver .... 10 grammes.
Iodide of silver .... 0·053 gramme.

b. A 10 per cent. bath which was left at rest some days with a surplus of iodide of silver at 50° F., contained in 100 cubic centimetres—

Nitrate of silver .... 9·94 grammes.
Iodide of silver .... 0·057 gramme.

c. A third bath, containing about 12 per cent., contained in 100 cubic centimetres—

Nitrate of silver .... 12·85 grammes.
Iodide of silver .... 0·077 gramme.

2. *Baths containing Alcohol.*

a. A bath of a practical photographer, composed at first in the proportion of 10 per cent., some weeks used, and then set apart because it became turbid, was found to contain in 100 cubic centimetres—

Nitrate of silver .... 8·45 grammes.
Iodide of silver .... 0·05 gramme.

b. Another bath used a long while, until it gave weak negatives, contained—

Nitrate of silver .... 11·60 grammes.
Iodide of silver .... 0·085 gramme.

As will be seen, this bath contained a much greater quantity of iodide of silver than the rest, even than the bath containing 12 per cent. of nitrate. This may be easily explained by the presence of alcohol, taken up by the bath from the plates prepared in it.

But in all cases the quantity of iodide of silver is but little, and does not reach 1 per cent. of the quantity of nitrate of silver.

From these results it follows that a bath may become useless, even containing a great quantity of free nitrate of silver.

Glycerine for keeping Plates moist.—Mr. Coleman Sellers, in a recent communication on this subject to the Philadelphia Society, says:—"I showed (in a former paper) that after a wet-collodion plate had been exposed and developed, it could be flowed with a solution of glycerine in water, and put away to wash, fix, and strengthen, if need be, at some future time. I did not want to do without water entirely, but recommended that an ounce or so of water be flowed over the developed picture before applying the glycerine, merely to wash off the spangles of reduced silver. I have, in my collection at home, hundreds of proofs made by those who have availed themselves of this process. Among them I may mention that Mr. Carbutt, of Chicago, last year made an excursion to the headwaters of the Mississippi, and made a great many pictures, all of which he kept moist with glycerine until his return to Chicago, after many weeks' absence, and then found the negative in all respects as if just made. The glycerine will not dry, and yet can be readily washed off to allow of the after-processes. A remarkable instance of the power of this substance to keep the plate wet has just come to light. On July 4, 1862 (nearly two years ago), a Mr. Denant went to Fairmount to take some views. He was to use the glycerine process. His collodion not being in good order, after a few trials he packed up his traps, and returned home. One negative he had flowed with glycerine. He left his apparatus at the residence of a friend, and, not having time to do more in the photography line, the apparatus was eventually sold to a gentleman, who always promised himself the pleasure of using it, but never did so. This negative, with the glycerine on it, came into my possession a few days ago, as I was looking over the apparatus in question, and I immediately cut it in half; one half I flowed with cyanide of potassium in solution without washing, and then washed and dried it; the other half I left as I found it, and now offer it to the consideration of the meeting. It will be seen that it is as wet as if just made, and yet has been in a dry box for nearly two years.

In regard to the use of glycerine in the manner and for the purpose recommended by me, I would say that it possesses properties admirably adapting it for this use. In the first place, its well-known keeping-qualities recommended it. It is readily soluble in water; it flows evenly over the collodion film; it penetrates that film, and renders it less liable to separate from the glass, and it can be more readily removed by washing, when the plate is to be cleared and dried, than any known substance of similar nature. Sugar, molasses, honey, and all the other sticky substances have been tried, but they all dry and form a crystalline deposit on the plate.

Photography and the Kaleidoscope.—At a recent meeting of the French Photographic Society, M. l'Abbé Laborde made a communication on photographing the images of the kaleidoscope. He said:—"The variety of designs presented by a kaleidoscope, when turned round, is familiarly known to every one, yet we are often surprised at the appearance of very curious and unexpected forms which we see disappear with regret.

"I have endeavoured to represent them by photography, and the means I employ are as follows:—I do not give them as excellent in every point, for I have only turned to account the objects I had at my disposal. I employed a quarter-plate camera, with its lens. In the groove of the frame a thick board was fixed, with a hole in the middle, into which the kaleidoscope was introduced; the small aperture through which the images are viewed was in the interior of the camera, and the axis of the instrument placed exactly on the prolongation of the axis of the objective: this latter is inserted in the ring in the front of a camera of long focus, and fixed in that position. The whole is then placed on an inclined plane, so that the light from the sky illuminates directly the objects reflected in the mirrors of the kaleidoscope. Instead of turning the instrument to produce the different arrangements, it is easier to apply some plain glasses upon which fanciful objects have been previously fastened. The regular figures which result are depicted on the ground glass of the camera of long focus, and the images are focused direct without being reflected; this portion is naturally more lighted than the others. It requires several minutes of exposure to obtain a picture on the collodioned plate. We cannot focus the portions of the image which are several times reflected; for they appear in the objective as if they came from greater distances, they lack distinctness, and they also exhibit the defect of planitude in the mirrors.

"Notwithstanding these imperfections, I believe I have attained the aim I proposed to myself, which is to place before the eyes of those who are occupied with stained glass, paper-hangings, and other kinds of ornamentation, very varied patterns which photography can supply by the hundred.

"I cannot pass over in silence another application of this instrument, although it is in some measure foreign to photography. On the surface of a disk of glass I glue a host of flat objects, such as paper patterns, small leaves, mosses, lichens, &c., and place them as near as possible to the external end of the kaleidoscope; and, by a mechanism which it is unnecessary to describe, I make the disk turn slowly, and thus present them successively to the inclined mirrors; we then perceive a series of changing figures depicted upon the ground glass, among which we can select those best suited to be fixed by photography.

"In a room completely darkened, we can project the images upon a stretched canvas, which will admit of their being seen by many persons at the same time. We must then bring the kaleidoscope nearer to the objective, in order to increase the dimensions and distance of the images, and illuminate the disk by a strong light; in a word, it is a magic lantern in which we replace the painted slides by a kaleidoscope. If, instead of objects glued upon the glass, we apply various tints mingled and thrown haphazard upon the surface of the disk, the figures receive the colours, and in their unexpected evolutions are very pleasing to the sight."

Medals of the French Photographic Society.—The annual distribution of Honorary Medals by the French Photographic Society has just taken place. M. Becquerel, the reporter of the Committee of Award, after explaining the principles which had guided them in their decision, mentions the fact that the competitors for the Duc de Luyne's prize and the Members of the Council of the Society had been excluded from their consideration in making the award. He then adds:—

"It is in consequence of these resolutions, and after having carefully examined the works which appeared to fulfil the conditions laid down, that the committee propose to award this year four Medals to the persons whose names here follow in alphabetical order:—

M. Blanquart Evrard.
M. Nièpce de Saint Victor.
Major Russell.
Warren de la Rue.

"The works accomplished by the parties named are too well known to the Society and to the readers of our *Bulletin* for it to be necessary for us to describe them; a few words will suffice to show the principal claims these names have upon your choice.

"M. Blanquart Evrard communicated to us, in the months of January and June 1863, his researches upon the intervention of art in photography, and the advantages that may be derived from the judicious employment of the vapours of iodine to locally modify a negative, and change the effect at pleasure. M. Blanquart is also one of the veterans of photography, and we cannot overlook the influence, in popularizing photographic productions, of the printing-establishment founded at Lille by his care.

"The publication of a work by M. Niépce de Saint Victor upon the application of anterior researches upon heliochromy to photography has appeared to us an occasion for recompensing an indefatigable inquirer who, ever since the origin of photography, has been constantly at work, and who, among the principal claims to the gratitude of photographers, reckons upon the employment of albumen and of glass in photographic processes.

"The name of Major Russell, although new in the photographic world, is no less known. His tannin process is now widely if not generally employed; this process is simple, practical, easily performed, and gives excellent results. The inventor, who first published his description of it in 1861, published another in 1863, and the numerous modifications he introduced into several chapters, particularly in that on developing, constitute in reality a new process.

"For about ten years Mr. Warren De la Rue has devoted himself with unparalleled perseverance to the study of astronomical photography. Apparatus of large dimensions have been specially constructed by him for this purpose, by which magnificent photographs of the moon, sun, planets, and fixed stars have been obtained, and, thanks to the labours of this *savant*, the representation of the stars by light, which some experimenters had previously attempted on a small scale, and possessing no scientific value, has become one of the interesting and brilliant applications of photography."

The conclusions of this Report were unanimously adopted.

Gallic Acid and Nitrate of Lead for Development.—In a paper recently read before the Philadelphia Photographic Society, Mr. Carey Lea describes some experiments in which he finds the salts of lead in conjunction with gallic acid very valuable. He says:—"When acetate of lead is added to a solution of gallic acid, a considerable quantity of acetic acid is requisite to redissolve the precipitate which forms. In positive-printing by development, this large excess of acetic acid is no objection, but rather an advantage, so much so that I have been in the habit of adding rather more than was necessary to effect complete solution. But in developing collodion negatives it would be objectionable. In the experiments which I have lately made, I therefore rejected the acetate, and substituted the *nitrate*. This salt is not so powerful an accelerator as the acetate, but has the great advantage of producing no precipitate. I believe that this is its first introduction into photographic use.

"The experiments were eminently successful. The new developer was found to act slowly, and to require a longer exposure than an iron developer. But the negatives exhibited the finest details, and were exceedingly bright and clean.

"The course which I recommend is as follows:—Make a solution containing

Gallic acid	50 grains,
Nitrate of lead......	100 „
Water	10 ounces*,

and filter it. This solution with me kept for several days until it was exhausted, and probably would keep for some time longer. Expose the plate as for a pyrogallic development. The bath and collodion which answer best are precisely those which work best with an iron developer, viz. a bromo-iodized collodion and a bath with the faintest possible trace of nitric acid. For example, add ten drops of nitric acid to an ounce of water, and take a drop of this very dilute acid to each five ounces of silver bath. When this development was tried with a simply iodized collodion (iodide of sodium), the negative was too hard, the details in the high lights were obscured before those in the dark shadows came out. I speak here, of course, of the lights and shades of the original view.

"To observe the peculiarities of this mode of developing, a plate was exposed with a very small stop for forty-two seconds, and when developed with iron was found to have had exactly the right exposure. The development required about half a minute. Immediately after, another plate exactly similar was exposed similarly, but for eighty-five seconds, and was developed with gallic acid and nitrate of lead. The picture came out slowly, and required about six minutes for development. When about half developed, the liquid was poured off, and a strong dose of silver solution added (proportion, nitrate of silver ten grains, citric acid twenty grains, water one ounce), and the whole poured again on the plate. After the lapse of six minutes from the first application, the original developer was still perfectly clear, although wine-coloured, and could have been kept on for some time longer without fogging.

"Of these two negatives, that developed

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* In metrical weights:—

Gallic acid	5 grammes,
Nitrate of lead.........	10 „
Water	500 CC.

with the gallic acid and lead-salt was the most pleasing in appearance, was the cleaner, brighter, and sharper of the two.

"For albumen, collodio-albumen, and many sorts of dry plates, I think this mode of development will be found to possess material advantages. I propose to make experiments in these directions, and would be glad if some one familiar with the Fothergill process would try this mode of development, or that with acetate of lead, and report the results."

Another Modification of the Carbon Process.—M. Obernetter, of Munich, proposes the following modification of carbon printing, in which he uses the purple of Cassius as a colouring-agent. The following summary of his process is from 'Le Moniteur de la Photographie.'

"In 50 grammes of water, dissolve 0·50 to 0·80 gramme of bichromate of ammonia; in another vessel dissolve 33 grains of pure gum arabic in 66 grains of water; add 10 grains of glycerine, and mix the two solutions. If the gum is not of the first quality, substitute an equal quantity of honey for the glycerine, to avoid crystallization.

"The purple of Cassius is prepared in the following manner:—Dissolve 120 grains of crystallized chloride of gold in 22 lbs. of water; dissolve 12 drachms of protochloride of tin in 35 ounces of water, and add 6 drachms of a concentrated solution of sesquichloride of iron.

"This last solution (of tin and iron) is poured into the solution of chloride of gold, and stirred. The mixture immediately becomes purple. Then add six to eight drops of sulphuric acid to precipitate the purple. To give it a more beautiful colour, supersaturate the solution by means of liquor ammoniæ. After a few hours wash the purple, decant, and collect it on a filter. We thus obtain nearly 15 drachms. It must be kept moist, so as not to lose its beautiful colour.

"Procure also some fine rich lampblack. Mix in a glass 4 grammes of the purple with a portion of the mixture of gum and bichromate. Add 4 grammes of lampblack. If they do not mix readily, add some drops of alcohol. This compound is added to the rest of the bichromated mixture. Filter it through linen, and leave it several hours to settle and allow the air-bubbles to escape.

"The mixture may be kept several days *in the dark*. It must be protected from daylight.

"When used it is poured upon a glass plate, like collodion, at a temperature below 120° F.

"The plates dry in from three to five minutes; they will keep three or four days in the dark.

"Exposure in the printing-frame takes from two to eight minutes in the sun, and from fifteen to thirty minutes in diffused light. The plates may be kept several days after exposure.

"Pour a sufficient quantity of collodion upon the exposed film, and dry it until the collodion acquires the consistency of gelatine, cut the edges of the film with a sharp knife, and put the plate in a basin full of water. The collodion with the picture separates from the plate; turn it while under water with the hand or by means of pincers, and place it on a white cardboard, and pour water upon it until it flows off quite clear. Finish by washing it with a mixture of alcohol and water.

"To fix the proof on white paper, take some gelatined or albuminized paper, and pour on it a mixture of water and alcohol, and press it on the proof. In a few minutes afterwards it can be separated from the cardboard."

The same gentleman, speaking of iron printing, states that ammoniacal citrate of iron and perchloride of iron with tartaric acid have not given him good results. He prefers the following mixture:—

Distilled water......	100 grammes
Citrate of iron......	5 „
Ox-gall	4 „
Nitric acid	1 to 3 drops.

This solution is poured on a glass plate, like collodion, and dried at a temperature above 120° F.

The exposed film is impregnated with lampblack or any coloured powder, which adheres only to those parts upon which the light has acted. The excess of colour is removed by means of a dry pencil, and the picture is covered with a varnish composed of gutta percha, one part dissolved in forty parts of chloroform.

The transfer to albumened paper is made as in the other process.

The dried picture is washed with water containing oxalic acid to remove the yellow colour from the lights.

REVIEW.

The Silver Sunbeam: a Practical and Theoretical Text-book on Sun Drawing and Photographic Printing. By J. Towler, M.D. New York: J. Ladd. Liverpool: J. Atkinson.

Dr. Towler is the editor of our esteemed contemporary, 'Humphrey's Journal.' The handsome volume before us is a very complete manual of photography in all its branches, carefully compiled, and stated with a simplicity and clearness which show the author to be a perfect master of his subject both theoretically and practically. We have pleasure in recommending this handsome volume to our readers as a reference-book on all branches of photography, and a guide in every-day processes.

MISCELLANEA.

Photography.—A Legless Action.—At the Sheriffs' Court, yesterday morning, before F. Gibbons, Esq., a Mr. Warren brought an action against a photographer named Anderson to recover 10*s.* 6*d.* damages, alleged to have been sustained in consequence of defendant not taking a dozen correct full-length photographic portraits of the plaintiff.—Plaintiff, upon being sworn, stated his grievance, and at once produced the portraits.—His Honour: Let me see them.—They were handed up, and his honour looked alternately from them to the plaintiff, remarking at last, "Why, really, Mr. Warren, I do not see how you can complain. I think they are exceedingly well done. In fact, if anything, the defendant has made you too good-looking" (laughter). Upon this the plaintiff, to the great astonishment of every one in court, quickly left the witness-box, leaped over the barrier in front of the clerk's desk, and jumped on to a chair.—His Honour looked considerably surprised at this, but he was still more startled to see the plaintiff draw himself up straightly, and holding his arms tightly by his side, ask, "There, your Honour, do you see anything amiss in my legs?" (roars of laughter).—His Honour (laughing): I do not see anything the matter with the portrait. Perhaps Mr. Buchanan will look at it.—Mr. Buchanan thought it was a very good portraït.—Plaintiff: But the legs—the legs—that is what I complain about.—Mr. Buchanan: Perhaps, while you were being taken you drew your coat over your legs in some way.—Plaintiff: My legs are all right, but he has made one shorter than the other (laughter). I showed the portrait to a lady, and she did not approve of it at all.—His Honour really did not see any just ground for this action. In fact, the plaintiff had not even a leg to stand on (laughter). The photographs were exceedingly well done, and plaintiff must be nonsuited. Defendant asked for costs, which were allowed.

The war appears to have had a stimulating influence on professional photography in the United States, 'Humphrey's Journal' remarks that war is good for the professional photographers. "The fact that each one of our braves, before offering up his life on the altar of his country, has his picture taken, makes business for the operator, the stock-dealer, and all others connected with them." The same journal says:—"What do our Northern operators think of the prices charged in the loyal Southern States (or rather the restored Southern cities) for vignettes, payable in greenbacks. *Ten dollars per dozen!* That was the price in Natchez, July 2nd. Here (New York) our operators work for a mere song; pictures are cheaper in New York than anywhere else. Why don't you raise your prices to, say, 5 dollars per dozen for vignettes, and 4 dollars for cards? In justice to yourselves you ought to do so."

Professional photographers should be warned against a new form of robbery to which they are subject, as shown in the following case:—

"On Tuesday, the 30th ult., about 5 p.m., a young man of rather respectable appearance entered Mr. Tear's photographic studio, 6 Upper Dorset-place, Clapham-road, for the purpose (as was supposed) of having his carte taken. Having made all the preliminary arrangements, and the sensitive plate exposed, Mr. Tear was engaged in the dark chamber developing the picture, a short time, as is well known (about three minutes), when this *gentleman* decamped with the lens, passing through the waiting-room and shop without exciting any suspicion. The man is about 5 ft. 8 in. in height, with brown hair and eyes, hair rather short, dressed in light trousers and vest, and dark brown Newmarket coat, a fancy tie, with gold ring (?), and soft 'billycock' hat. On the lens is engraved 'Ross, London, 10,098.' This worthy appears to have made a little over-calculation, for we are informed that Mr. Tear possesses an excellent negative, of which, doubtless, by this time, copies are being circulated among the police."

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

M. E. L.—In order to make water-colours work easily on albuminized paper, some preparation is desirable; many artists have especial preparations of their own for the purpose. A solution of gum tragacanth is sometimes used; but the best material we know is a preparation sold for the purpose by Newman, of Soho Square. It is generally desirable to have a moderately light impression for colouring in water-colours, so as to avoid the heavy dark lines of which you speak; but where you have to colour dark impressions, some powerful colour should be used for the first colouring over black shadows, so as to warm them. Indian red will often be found useful for such a purpose, as it will more readily kill the heavy blacks than most pigments.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 150. OCTOBER 15, 1864.

PHOTOGRAPHIC SOCIETY.

The First Meeting of the Session will take place at King's College, on Tuesday, November 1st, at eight o'clock.

Meetings of the Society, 1864–5.

1864.	Tuesday, Nov.	1
	„ Dec.	6
1865.	„ Jan.	3
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Portrait Copyrights.

We publish, in another column, the full report of a case recently decided at the Clerkenwell Court; and we do so because it presents certain points of great importance to those who pursue photography as a profession. As there was no notice of appeal against the magistrate's decision, we may consider his interpretation of the Photographic Copyright Act to be sound in law and valid for precedent. The British public decided that it wanted a portrait of one Franz Müller, a poor insignificant German tailor, who had been sent for from New York, because certain circumstantial evidence connected him with some transactions which might afford a clue in discovering the perpetrators of a most appalling and bloody murder. A photographer found that he possessed two negatives of the object of interest. One of these was so bad that even Müller rejected it; nor was the accepted picture much better as a work of art. But the curiosity which required Müller's portrait was of the kind which is satisfied with very coarse food. The prints from these negatives sold so rapidly that it was worth the while of a photographer amiably desirous of gratifying his fellowcreatures to reproduce the pictures. With the modesty that characterises genius, he omitted any reference to the dexterity displayed in showing how very bad photographs could yet be made much worse. But the most vile of the execrably bad reproductions was quite good enough to satisfy the morbid cravings of those who created the market. So there could be no particular sympathies, scientific or social, enlisted in the case when Mr. Henderson, the photographer, took proceedings against Mr. Daniells, reproducer, for infringing a copyright which the magistrate decided to belong to Müller himself, who had paid for the portrait, and, "as yet unknown to fame," had given no sanction to its publication.

It is clear that this opens a new field for speculation to those interesting members of society who may, by any unfortunate mischance, come to be wanted by the police, "*bona si sua norint.*" But it is equally obvious that it behoves photographers to be careful before they apply to the taking of portraits

> ". . . . the good old rule, the well-known plan,
> That they shall *take* who have the power,
> And they shall keep who can."

The significance of the magisterial decision in this case has not escaped the observation of practical photographers. In the ensuing session of the Meetings of the Society we have reason to expect that the subject will be brought under consideration.

The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors.

No notice can be taken of anonymous communications. Whatever is intended for insertion *must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith. The same proviso extends to communications to the Editor.*

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

[From our own Correspondent.]

Bath, Sept. 23rd, 1864.

We have just concluded the Thirty-Fourth Annual assembly of the British Association, the Meetings having proved in all respects pleasant and successful. The attendance of members was very large, and every one seemed charmed with this beautiful city and its neighbourhood. The Meeting opened, on Wednesday the 14th, with an able address by Sir Charles Lyell, the President. His address, as might be anticipated from the nature of his studies, chiefly referred to matters of geological interest, nevertheless it contained one announcement which will probably be read with great interest by photographers; I refer to the recent discovery of an abundant source of the metal lithium. It appears that a hot spring has lately been discovered at Redruth, in Cornwall, which yields four times the quantity of solid matter found in the Bath waters, and that a very large proportion of this solid matter is the metal lithium. I will quote a few of the President's statements on the subject textually. He says, "It is rich in the chlorides of calcium and sodium, and it contains one of the new metals, cæsium, never before detected in any mineral spring in England; but its peculiar characteristic is the extraordinary abundance of lithium, of which a mere trace had been found by Professor Roscoe in the Bath waters; whereas in this Cornish hot spring this metal constitutes no less than a 26th part of the whole of the solid contents, which, as before stated, are so voluminous. When Professor Miller exposed some of these contents to the test of spectrum analysis, he gave an opportunity of seeing the beautiful bright crimson line which the lithium produces in the spectrum. Lithium was first made known in 1817 by Arfvedsen, who extracted it from petalite, and it was believed to be extremely rare until Bunsen and Kirchhoff, in 1860, by means of spectrum analysis, showed that it was a most widely diffused substance, existing in minute quantities in almost all mineral waters and in the sea, as well as in milk, human blood, and the ashes of some plants. It has already been used in medicine, and we may therefore hope that, now that it is obtainable in large quantities, and at a much cheaper rate than before the Wheal Clifford hot spring was analyzed, it may become of high value. According to a rough estimate which has been sent to me by Mr. Davey, the Wheal Clifford spring yields no less than 250 gallons per minute, which is almost equal to the discharge of the King's Bath, or chief spring of this city." As the salts of this metal have given very valuable qualities to collodion prepared with them, a cheap and abundant supply is matter for congratulation to your readers.

On Thursday the sectional meetings and evening lectures and *soirées* commenced. The subjects of an essentially photographic character were less numerous than interesting. Rarely perhaps has a photographic lecture been given to so numerous and enthusiastic an audience as was Dr. Roscoe's eloquent address on the "Chemical Action of Light," delivered in the handsome and capacious theatre on Friday night. Amongst the interesting experiments introduced, none elicited more delighted attention than the exhibition of the brilliant and wonderfully actinic light produced by the combustion of magnesium wire. Mr. Brothers, of Manchester, obtained a negative of Sir Charles Lyell during the lecture, using the magnesium light; and in the course of the evening an enlarged image of a transparency from the negative was projected on a screen by the aid of the magic lantern, and elicited immense applause. The general facts which formed the staple of the lecture are of course well known to your readers; but they are restated in such a clear and succinct form that I cannot forbear making a few extracts. After some interesting remarks on the nature of light, he said:—

"Let me, in the first place, endeavour to give you some examples of the chemical action effected by light. I need do no more than refer, as a familiar example, to that most beautiful of modern arts, photography, illustrating, as it does, at once the simplest and the most complicated of the chemical actions of light. The simple action consists in the decomposition of silver salts, chloride, bromide, and iodide, by the light, in the blackening, for instance, of photographic paper in the sunlight: the most complicated of the actions is exemplified in that wonderful latent image formed upon the sensitive plate, the light having effected upon the chemical constituents a change which is invisible even under the microscope, but which enables them to decompose when brought under the influence of certain deoxidizing agents—the developers of the photographers. The theory of the photographic processes is at present in its earliest infancy. The art has progressed far; but, as is usually the case, the science follows only slowly. We know little about the composition even of the visible image; we know nothing about the kind of decomposition which occurs in the formation of the latent and invisible image; nor are we acquainted with the scientific explanation of the employment of the various reagents used amongst photographers. A second illustration of the chemical action of light is the combination which light effects upon a mixture of the two elementary gases, chloride and hydrogen. I hold in my hand a small glass bulb filled with a mixture of exactly equal volumes of chlorine and hydrogen. These gases will remain for any length of time in contact without the slightest combination ensuing, if they are kept in the dark and kept cool; expose them but one second to the direct sunlight, and combination ensues so rapidly that a sharp explosion occurs, owing to the great heat which is evolved. I have here the power of producing a light so rich in the chemically active rays that the result will be the same as if I threw the bulb into the sunlight. I wish next to illustrate the fact that only those of the sun's rays which exist at or near the violet end of the spectrum have the power to act thus chemically. The light evolved by phosphorus burning in oxygen contains so much chemically active light, that it will explode the bulbs of chlorine and hydrogen. If, however, I burn the phosphorus in a globe of red glass, the chemically active blue rays cannot pass; they are all absorbed by the red colouring matter of the glass, and the bulb exposed to this light will not explode. If, on the other hand, I burn the phosphorus in a similar globe made of blue glass, the highly refrangible blue rays will pass through, and falling upon the chloride and hydrogen bulb, it will explode.

"As a third and last example of the chemical action of light, I would refer to the relation in which the chemical rays stand to vegetable life. If we examine the chemical constitution of vegetables, we find that they consist almost entirely, although the other constituents are necessary, of carbon, hydrogen, and oxygen—substances all contained in the atmosphere. When vegetable matter is destroyed by oxidation, or burnt, carbonic acid and water are formed, and heat is evolved. It is upon this heat alone that animals exist; all their energy is thus heat thrown into other channels, and their forces are derived from those locked up in the vegetable organisms upon which they feed. Whence is this heat derived? How do plants then accumulate this store of energy? They *obtain* it from the sunlight. The plant absorbs the rapidly vibrating solar radiations, and stores them up ready to be again given out in various forms of energy when the vegetable organism is destroyed by oxidation. It is the sunlight which, acting upon the green colouring matter of leaves, decomposes the carbonic acid of the air into its constituent elements, enabling the plant to assimilate the carbon, and to turn the free oxygen back into the air for the subsequent use of animals. But in this case, as with the chlorine and hydrogen, it is only the most refrangible, the blue portions of the sun's rays, which are able to effect this decomposition. I can illustrate this power which the green leaves possess of absorbing the chemically active rays, whilst leaves destitute of that colour allow the rays to pass through them without effecting any chemical decomposition. I have here some leaves of the variegated mint; a portion of each leaf is green and a portion colourless. Both portions are equally transparent to common visible light, as we see when we throw the image of the leaves on the screen by means of the lantern.

Here I have a sensitive photographic plate, and I will place the leaves upon the sensitive surface, and then expose the leaves to a strong light, so that the rays must pass through the leaves before they reach the plate. I can show you that this light of burning magnesium wire possesses powerful chemical action, as it immediately causes a bulb of chlorine and hydrogen gases to explode when brought near. On developing the latent image produced, we shall see that none of the chemically active rays have passed through the green parts of the leaves to the sensitive plate, whilst the white portions have proved transparent to the chemical rays, and the film has, in those parts, been decomposed. Hence, too, in photographs, the leaves of trees through which the light has been transmitted appear black, whilst the light which is reflected from leaves containing chemical rays produces the proper effect."

After some remarks on the importance of measurement of chemical action, he proceeded:—

"The method of measurement of the chemical action effected by the total sun- and daylight, which I shall endeavour to explain, is, I believe, now so far perfect that it may be introduced for practical registration in meteorological observatories. The instrument which I hold in my hand is all that is needed for making the observations; and the curves of daily chemical intensity upon the diagrams (to which I shall again refer) show the kind of results thus obtained. For some years I have had the pleasure and advantage of being associated, in a series of researches upon the measurement of the chemical action of light, with a man whom I am proud to number amongst my most intimate friends—Professor Bunsen, of Heidelberg; and to him I am glad to be able to ascribe the merit, if such be found, in the method which I shall endeavour to make plain to you. This method consists in the exact estimation of the time which a photographic paper of a constant degree of sensitiveness requires to be exposed to light in order to attain a certain given tint, it being ascertained that this same tint is always produced when the same amount of light falls upon the sensitive paper. Hence it was necessary to construct an apparatus in which photographic sensitized paper could be exposed to the sunlight for definite times measured by small fractions of a second. This instrument consists essentially of a pendulum, vibrating about three-quarter seconds, by whose oscillation a sheet of darkened mica is withdrawn from, and brought back over, a horizontal strip of paper prepared with chloride of silver, and placed in a constant position relative to the pendulum and sheet of mica. The time during which each point in the length of the strip is exposed is different, and the time of exposure for each point can be calculated when the length and position of the strip and the duration and amplitude of the pendulum's vibration are given. The strip of sensitive paper presents, after exposure, a gradual diminution of shade from dark to light, and for each shade the time of exposure is known. In order that such a graduated strip may serve as a means of measuring the chemical action of light, we require—

"1. To know the relation existing between the several tints and the intensity of the light necessary to produce such tints.

"2. To construct sensitive paper which shall always possess the same degree of sensitiveness, and can easily be prepared when required.

"It was found, by a long series of experiments, that it was possible, by adhering strictly to a certain method of manipulation, to prepare standard papers, which, when made, possess a constant degree of sensitiveness, so that, if the same light falls upon them, the papers are always coloured to the same tint. Experiment, likewise, showed that the tint attained by such a paper was constant when the quantity of light falling upon it also remained constant; so that light of the intensity 50, falling upon the paper for the time 1, produced the same blackening effect as light of the intensity 1 falling upon it for the time 50. Knowing this law, which regulates the degree of shade of the paper, and having a surface of a perfectly constant degree of sensitiveness, it is easy to obtain absolute measurements of the chemical action of light. For this purpose an arbitrary unit of measurement is chosen, by making a standard tint which can be easily and exactly reproduced at any time. The quantity of light which shall, in a second or unit of time, produce a blackening effect on the standard photographic paper equal to that of the standard tint is said to have the chemical intensity 1. If the time needed to produce this same tint is found, by experiment with the pendulum-photometer, to be two seconds, then the chemical intensity is one-half, and so on. All that is needed, in order to obtain accurate measurements of the chemical action of diffused daylight or sunlight, is to be able to find the time necessary to effect a blackening of the normal paper equal in shade to the standard tint. This is done by means of the graduated strip made in the pendulum photometer.

"For the purpose of accurately comparing these tints, the ordinary daylight or even lamplight cannot be used, as a change would thereby be produced on the sensitive paper. A light which does not act chemically must be used; such a light is the monochromatic soda flame * * * *. The light from this flame possesses another advantage, namely, that the unavoidable differences of colour are not seen, variations in shade alone being perceptible. By help of this soda flame, the coincidence of shade of the graduated strip with the standard tint can be read off with the greatest precision. In order to measure the chemical intensity of the daylight at any time, all that is needed is to expose a strip of standard paper in the pendulum photometer for a given number of vibrations, and then to find upon the strip thus exposed the point at which a shade equal to the standard tint has been produced. Reference to a table gives the time of exposure necessary to produce this tint, and the reciprocal of this time represents the intensity of the acting light. If the time necessary were three seconds, the chemical intensity would be one-third; if the time were half a second, the intensity would be two. In this way curves of daily chemical intensity have been obtained, which show the variation caused by clouds or by the changing altitude of the sun. These curves show maxima and minima exactly corresponding to the appearance and disappearance of the sun behind a cloud. The difference between the sun's chemical intensity in summer and winter is thus also depicted. Based upon the principles of the pendulum photometer, a much simpler method of making these measurements has been arranged as follows:—A graduated strip made in the pendulum photometer is fixed in hyposulphite of soda, and pasted upon a board furnished with a scale. The shades of certain points on this fixed strip are compared with the shades on given points upon a graduated strip, prepared in the usual way, and not fixed in hyposulphite. The fixed strip is thus calibrated in terms of the unit of measurement, and it may then be used as a means of measuring the chemical action of light. Small pieces of the standard paper are then exposed for a given time to the light which it is desired to measure, until the shade approaches that of a part of the fixed strip; the point of exact coincidence is then read off by the soda flame as usual. In this way a piece of standard paper of one square inch of area will serve for twenty separate determinations, and the whole arrangement for exposure may be carried in the pocket."

After some further remarks and experiments, he proceeded:—

"The spectrum of burning magnesium is exceedingly rich in violet and ultra-violet rays, partly due to the incandescent vapour of magnesium, and partly to the intensely heated magnesia formed by the combustion. So long ago as 1859 the chemically active power possessed by this light, compared with that of the sun, was determined, and the use of this light for the purposes of photography was proposed. It was shown that a burning surface of magnesium wire, which, seen from a point at the sea-level, has an apparent magnitude equal to that of the sun, effects on that point the same amount of chemical action as the sun would do if shining from a cloudless sky at a height of 99° 53′ above the horizon. On comparing the visible brightness of these two sources of light, it was found that the brightness of the sun's disc, as measured by the eye, is 524 times as great as that of burning magnesium when the sun's zenith-distance is 67° 22′, whilst at the same zenith-distance the sun's chemical brightness is only five times as great. Hence the value of this light, as a source of the chemically active rays for photographic purposes, becomes at once apparent. In the memoirs published in the above year it is stated that the steady and equable light evolved by magnesium wire burning in the air, and the immense chemical action thus produced, render this source of light valuable as a simple means of obtaining a given quantity of chemical illumination, and that the combustion of this metal constitutes so definite and simple a source of light for the purposes of photochemical measurement, that the wide distribution of magnesium becomes desirable. The application of this metal, as a source of light, may become even of technical importance. A burning magnesium wire of the thickness of 0·297 millimetre evolves as much light as 74 stearine candles, of which 5 go to the pound. If this light lasted one minute, 0·987 metre of wire, weighing 0·120 gramme, would be burnt. In order to produce a light equal to 74 stearine candles burning for ten hours, whereby about 20lbs. of stearine is consumed, 72·2 grammes (2½ ounces) of magnesium would be required. The magnesium wire can be easily prepared by forcing out the metal from a heated steel press having a fine opening at bottom; this wire might be rolled up in coils upon a spindle, which could be made to revolve by clockwork, and thus the end of the wire, guided by passing through a groove or between rollers, could be continually pushed forward into a gas or spirit-lamp flame, in which it would burn."

The excellent paper by Mr. Claudet on "Photosculpture" I send you in full, as you will probably lay it before your readers in its entirety. I may add that a model of the apparatus was shown to illustrate the working, and some very pretty busts and statuettes formed admirable illustrations of the capability of the invention. A bust of Sir Charles Lyell was a capital portrait; the negatives had been produced only a few weeks previously, and, as I understood Mr. Claudet to say, the bust had been completed without the artist in the sculptural department ever having seen Sir Charles at all.

Photosculpture. By A. Claudet, F.R.S.

If in our time opinions are divided as to whether photography is finally to exercise a beneficial influence upon the fine arts, or the contrary, there is no question that its innumerable useful applications are a boon to the community.

After having been habituated to photography, we can scarcely suppose it possible to do without photography, as we might say of railways or of the electric telegraph.

Photography may have been the enemy of all that was inferior in the arts of painting and engraving, but is that to be regretted?

Instead of the dabblers in portraiture who were satisfying a morbid taste, we have a great army of photographers capable of representing the human form and features in the utmost perfection. Printing itself, that universal and powerful aid of civilization, was only established by superseding a class of artists who had, at least, the merit of spreading by their work knowledge and literature during many centuries. They indeed produced *true works of art*, which, though no longer repeated, are to be admired in the museums where they are preserved.

As to the art of painting, instead of being injured, it is served by photography, which enables artists to be more perfect in their design, and to study the beauty of forms yielded by the photographic mirror.

Photography, in multiplying marvellous representations of the beauties of nature, tends to inculcate the taste for artistic productions. There will be fewer bad painters because there will be less and less demand for inferior paintings. Fine works only will be esteemed, and the taste for art will increase in proportion to the value of its productions.

Is it not the same in literature? Who can deny that the more refined and pure it is, the more it educates and disposes the mind to reject whatever has not the stamp of genius?

In an enlightened age inferior literature cannot exist. So the fine arts will be improved by photography. Notwithstanding the alarm of narrow minds incapable of appreciating progress, the discoveries which are based upon science will ultimately produce good, and benefit society. To the painter, photography affords the means of being absolutely correct in design. Reference to photographs in painting portraits, representing draperies, &c., saves immense trouble, and obviates the necessity of long and repeated sittings.

But how can it be said that photography prevents the artist from imparting to his work the impress of genius? Photography is for him only a useful auxiliary.

Nothing, however, can arrest the strides of photography; it extends every day its applications, and gradually invades every art.

Who would have expected that photography was to be the means of sculpture?

Yet, however extraordinary such a prognostication might appear, however difficult at first thought it may be to understand the possible connexion between flat representation of objects and their solid form, it has been proved that from flat photographs a bust, a statue, or other object of three dimensions can be made by a mechanical process without the necessity of the sculptor's copying the original, or even seeing it at all. Yet the result is a perfect facsimile of the original! Moreover the work is executed in one-tenth of the time required for modelling by hand.

This beautiful application of photography is called *Photosculpture*, and is the invention of Mr. Willème, an eminent French sculptor.

Before explaining how Mr. Willème was led to this discovery, let me remind you that photography itself was invented by painters of talent, by *artists*, who, while using the camera obscura for studying the subject of their intended pictures, were struck with the beauty of those natural representations. In ontemplating them they naturally desired that the pictures could be permanently fixed. Considering that these pictures were formed by the light reflected from the objects, they essayed to fix them by availing themselves of the known scientific fact that light had the property of blackening certain chemical compounds.

The flash of that idea was enough; their genius and perseverance solved the problem, and they created that art which they desired so much—Photography!

A similar and no less instructive story may be told of photosculpture. Mr. Willème was in the habit, whenever he could procure photographs of his sitters, of endeavouring to communicate to the model the correctness of those unerring types. But how was he to raise the outlines of flat pictures into a solid form?

Yet these *single* photographs, such as they were, would serve him to measure exactly profile outlines. He could indeed, by means of one of the points of a pantograph, follow the outline of the photograph, while with the other point directed on the model he ascertained and corrected any error which had been communicated to his work during the modelling. What he could do with one view, or one single photograph of the sitter, he might do also with several other views if he had them. This was sufficient to open the inquiry of an ingenious mind. He saw at once that if he had photographs of many other profiles of the sitter, taken at the same moment, by a number of cameras obscuras placed around, he might alternately and consecutively correct his model by comparing the profile outline of each photograph with the corresponding outline of the model. Such was the origin of a marvellous and splendid discovery. But it soon naturally occurred to him that, instead of correcting his model when nearly completed, he had better work at once with the pantograph upon the rough block of clay, and cut it out gradually all round in following one after the other the outline of each of the photographs.

Now supposing that he had 24 photographs, representing the sitter in as many points of view (all taken at once), he had but to turn the block of clay, after every operation, $\frac{1}{24}$th of the base upon which it is fixed, and to cut out the next profile, until the block had completed its entire revolution, and then the clay was transformed into a perfect solid figure of the 24 photographs—the statue or bust was made!

When this is once explained, every one must be struck with admiration at the excellence of the process. It is so sure and so simple, that we are surprised it had not been thought of before. But so it is with the most valuable inventions. They wait until some genius grasps the idea, and conceives how to make them practical.

It will, perhaps, be argued as a defect of photosculpture, that, being the result of a mechanical process, it leaves no opportunity for the display of artistic taste or feeling, and that its productions must therefore be only vulgar and matter of fact. This would be a mistake; because the sculptor, who has to direct the last operation, will exercise his skill in communicating to the model all the refinement with which, as a sculptor merely, he could have endowed it. For supposing the photographs to have been deficient in attitude or expression, in giving the last touches to the model, the sculptor can correct those imperfections. The pantograph of photosculpture will communicate to the clay the true character and the proportions of the object, with all the correctness of the photographs; it will produce a perfect likeness, and it will be necessary to give to this first draught the softness and finish of a work of art. These of course cannot be imparted except by the skilful hand and the intellectual feeling of a true artist. In short, as the model must be touched by a sculptor, it is clear that the sculptor so engaged should be such as will not spoil the work of the unerring machine, but, on the contrary, improve it in many particulars, and even add to it the sentiment of art. Therefore the process of photosculpture is to put into the hands of a skilful sculptor a model perfect in its proportions, correct in design, full of character, including draperies of the most elegant outlines, such as only are represented by photographs; and this model, so prepared for him, would have required a tedious labour with the disadvantage of much uncertainty.

As photography has been the means of improving the art of painting, so photosculpture is destined to improve sculpture, and to spread in all classes the taste for this noblest branch of the fine arts. It may be said that sculpture is understood only by a very limited number of educated minds. It is seen only in palaces, in the public galleries, and in the mansions of the rich. Good sculpture is very expensive, and for this reason it is not customary for the middle classes to employ sculptors to execute busts or statuettes of relatives or friends. Besides the question of price, there are very few artists capable of producing such a work as shall be an inducement to the possession of this kind of similitude. Photosculpture, therefore, opens a new era by the advantages of its procedure. The work is done with greater accuracy, in a very short time, and consequently at a moderate price. The original has only to sit once for the photograph, and then in a few days, without further trouble, or the necessity of appearing repeatedly before the sculptor, a bust or statuette is produced. Such facilities cannot fail to make the demand very general, and this must cause the employment of a great number of artists. The "ateliers" of photosculpture are indeed *to be the best school of sculpture*, from which will issue a succession of skilful artists, who, having practised the mechanical process, will be able, when photographs cannot be obtained, to model by hand. Therefore the art of sculpture must in every way benefit from the practice of photosculpture, which, undoubtedly, we shall see honoured in the dwellings of thousands, not only as regards portraiture in general, but also as to the resemblances of those who by their genius and virtues have deserved our admiration and esteem.

Again, photosculpture will be the easy and inexpensive means of reproducing in various sizes, and with unerring faithfulness, the beautiful remains of antique sculpture. whether statues, vases, or other objects which can only be seen in museums and galleries, and thus the public can possess, at a small cost, copies or rather facsimiles of the great creations of past ages. The only copies existing of those works cannot often be repeated, for they must be made at some risk of injuring the original, the only process hitherto known being that of taking casts; hence they are expensive and rare. To obtain a certain number of photographs of these precious relics is all that will be needed for their reproduction by the photosculpture process.

Photography has already been the means of copying the paintings of celebrated masters existing in public and private galleries. By those photographs every one is enabled to possess copies of the noblest works in the art of painting. These copies contain composition, design, and everything capable of conveying the feeling of the artist; but they are deficient in one essential—colour!

It is otherwise as regards the representation of statuary, which leaves to the mind to imagine colour. Photosculpture has then the advantage of reproducing works in sculpture without depriving us of any of the attributes which have made them famous.

Photosculpture will further be applied to the representations of animals, showing them in true and natural attitudes; by this means faithful models will be introduced in the manufacture of porcelain, clocks, furniture, and much that contributes to the embellishment of our dwellings.

In a word, photosculpture is calculated to spread the taste for the beautiful in form; it opens a new era, which will be remarkable in the history of the fine arts.

I have thought that I could not give to the meeting a better illustration of the process of photosculpture than by executing the bust of our illustrious president, Sir Charles Lyell. I invited Sir Charles for this purpose, and he was kind enough to sit for his photographs on the 16th August.

The machine has done the work, the sculptor has given the finishing-touch to the model, and here is the bust completed, Sir Charles not having seen it before I brought it to the Meeting!

In so short a time I have also been able to obtain of the same bust a model in bronze, and I leave to the Meeting to form some opinion of photosculpture by this and other examples now near me.

At the conclusion of the lecture, Mr. Claudet illustrated, by means of a model, the mode of working in photosculpture, and also exhibited a number of busts and statuettes produced by the process, which were examined with much interest.

Dr. Roscoe read two papers, in the Chemical Section, relating to photography. One contained very interesting suggestions for establishing a system of quantitative photography. He remarked that, up to the present time, the theory of photographic processes was in the first or quantitative stage, and then proceeded to describe some of the results of experiments undertaken for the establishment of a quantitative photography, the method being based upon the experimental law laid down by Professor Bunsen and the lecturer, to the effect that a constant product of the intensities of the acting light into the times of exposure always corresponds to a constant tint on the photographic paper. Hence if several prepared papers were exposed to a constant source of light for varying times, in order that they should all exhibit the same tint when examined by the soda flame, the relative sensitiveness of the papers would be represented by the reciprocals of the said times. To overcome the difficulty of exposing papers of varying sensitiveness for different times, until a uniform tint was obtained, the papers were all exposed the same length of time, and the different tints produced read off upon a graduated standard strip prepared in the pendulum-photometer, and the time calculated which each paper must have been exposed in order to bring them all to one tint taken as the standard.

It had been previously ascertained that variation between certain limits in the strength of the silver bath but slightly affected the sensitiveness, but that the strength of the salting solution had a most important influence in this direction. Papers prepared with varying proportions of chloride of sodium, and then excited on a 10 per cent. silver bath and their degrees of sensitiveness recorded, that salted with a 1 per cent. solution being taken as the unit, and curves drawn indicating the relative sensitiveness of each of the other papers, a carefully tabulated statement of the progressive increase of sensitiveness with each increase in the strength of the salting solution was then secured. The experiments were tried with the chlorides of sodium, potassium, and ammonium; but no variation in sensitiveness was found to arise from the use of the different metals when the quantity of chlorine remained constant.

Experiments with iodides and bromides were also recorded; the former, however, even after long exposure, was not sufficiently affected to admit of satisfactory measurement of its sensitiveness, notwithstanding that in the formation of a latent image it is so much more sensitive than the other haloid salts of silver. Bromide of silver was found to be considerably more sensitive than chloride, and a mixture of bromide and chloride was found as sensitive as the bromide alone. A mixture of iodide and chloride was found to give a great accession of sensitiveness; and a mixture of equal parts of the three salts, chloride, bromide, and iodide, gave still more sensitive results. With a mixture of bromide and iodide a remarkable decrease in sensitiveness was observed, the retarding action exerted by iodide being analogous to the retarding action exerted by the traces of small quantities of foreign gases upon the sensitive mixture of chlorine and hydrogen, and probably belongs to that class of action to which the name of photochemical induction has been given.

This paper was followed by another by Dr. Roscoe, in which he described the method of photochemical measurement already referred to in his lecture. I subjoin a brief report I find already in print of the discussion which followed, in which it will be seen that the chemical activity of the blue ray in the decomposition of carbonic acid in the nutrition of plants was denied.

Dr. Daubeny wished to ask Professor Roscoe a question respecting his recent lecture in the theatre. Some thirty-four years ago he (Dr. Daubeny) made some experiments on the action of light upon plants, and he came to the conclusion that chemical rays had no action upon the decomposition of carbonic acid in plants, but it was done by the luminous rays. His opinion had since been confirmed by Professor Draper. He understood Professor Roscoe had come to an opposite conclusion, and he wished to know on what observations he had come to such a conclusion.

Professor Roscoe said he certainly did state, and he must say that he believed at that moment, that it was the chemical rays which had the power of decomposing the carbonic acid. He said this with all respect to Dr. Daubeny and Professor Draper. He should be glad if Dr. Daubeny would relate his experiments in which he proved it was not the chemical rays that decomposed the carbonic acid. He was about to say that he had not made any experiments upon the subject, but he believed it was generally admitted that chemical rays were those which decomposed carbonic acid.

Dr. Daubeny said he held a contrary opinion.

Professor Roscoe said he imagined the fact that blue rays were absorbed entirely by the green colouring-matter of plants proved what he advanced. They found that the green matter of plants would not allow those rays to pass, whereas the parts which were colourless did allow them to pass. This was a proof that it was the really highly refrangible rays which decomposed the carbonic acid.

Professor Miller believed it had been shown that it was the luminous rays which effected the decomposition of carbonic acid.

Dr. Sullivan said there was a phenomenon which preceded the green leaves—that of the conversion of the white compound which preceded the leaves. Would the spectrum deprived of chemical rays produce the green?

Dr. Daubeny said the direct conclusion he came to was that luminous rays were those that were efficient; but as he used coloured glasses in his experiments, he wished to know if it had been established by other experiments that he and Professor Draper were in error.

Professor Williamson said they had a great number of rays, all of which acted, some on one compound and some on other compounds. It did appear to him that the great direction of future investigation should be to determine what it was they were speaking of when they spoke of chemical rays. He thought it might turn out that many luminous rays did produce definite chemical action upon certain classes of bodies.

A paper on the application of photography and the magic lantern to educational purposes, by Mr. S. Highley, was read, and some fine transparencies exhibited. Mr. Brothers explained the method of producing some very fine enlarged photographs of the moon, a transparency from a small negative being first obtained, and from this an enlarged negative. A novel application of photography was described by Mr. Sorby. After acting upon samples of iron and steel with acids so as to lay bare their structure, he obtains enlarged microscopic photographs of each sample, and thus affords an excellent means of examining at leisure the exact structure of each specimen.

These were the chief matters of photographic interest in the varied programme which was brought under the attention of members. The next Meeting is to be held at Birmingham, a somewhat dreary contrast to the pleasant city of Bath, so beautifully surrounded by wood-crowned hills. Birmingham and the neighbourhood will not be wanting, however, in matter of scientific interest.

A New Step in Photography.*

Few of the arts show such signs of vitality as the infant one of photography. It would be strange, indeed, if an art which has so much of novelty and marvel about it, which gives to idlers the most graceful amusement, and to workers the most splendid results, which interests equally the man of science and the lover of art, which yields not merely a livelihood, but immense gains to many who practise it, and which is, nevertheless, in its infancy, should not display great vigour and make continual progress. One more step of a mighty progress we chronicle today—a step that, though small in itself, is of immense importance and amounts to a revolution in photography. It is the step by which now at last we can produce a permanent print. Englishmen and Frenchmen have hitherto carried off the chief honours of discovery in photographic science; but this last discovery is the work of a German. To explain more clearly what he has accomplished, we propose to state as rapidly as possible what has been already done in the science.

It is not very long since Wedgwood and Davy failed to fix the image which sunlight impresses, and had long been known to impress, upon any surface impregnated with nitrate of silver. Documents exist which prove that, though pictures on silvered paper were obtained about the commencement of the present century, no means could be found to fix the fleeting image. Disheartened by continual failure, our men of science let photography go to sleep, and nothing effectual was done in it until, excited by the discoveries and speculations of Nièpce de St. Victor and others, Daguerre obtained pictures on metal plates that promised permanence. The application of vapour of iodine to the silvered plate gave the daguerreotype image, and this process was the pioneer of all the so-called "negative" processes now used in photography. Scarcely had the beautiful process of Daguerre been made public, when our own countryman, Mr. Fox Talbot, made a further step in advance

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* From the *Times.*

—one which at once gave a great practical value to the photographic art; he discovered the means of producing upon paper so-called "positive" images of the objects to be pictured. Independently of Daguerre, he had succeeded in producing negative images on paper,—that is, images in which the conditions of light and shade are the reverse of those existing in nature, the shadows being represented by lights, and the lights by shadows. He now succeeded in printing from this negative any number of positive images in which the lights were lights and the shadows shadows. It was a vast stride, and that which followed was also vast. It was recommended by Le Grey that collodion should be used as the vehicle for the sensitive salts which, spread out in a film, receive the sun-picture. The practical mind of Archer seized the idea, and, spreading the collodion on a glass plate, discovered the means of obtaining very much increased delicacy of detail—a negative picture of far greater value than paper could possibly produce. Thenceforward to the present time various improvements have been made in the process of taking the original negatives. Greater sensitiveness and, as a consequence, greater rapidity of action have been imparted to the collodion-film; and this negative process now leaves little to be desired, save and except one thing—the means of impressing the sensitive surface instantaneously with any kind of picture. Instantaneous pictures of great beauty have been obtained, and chiefly by Colonel Stuart Wortley, but they are for the most part confined to the representations of objects brilliantly lighted. Save for this defect of instantaneousness, the method of taking negatives on a film of collodion spread over glass is well nigh perfect.

It is in the process of transferring the negative image into a positive one many times repeated that the chief difficulty of photography now arises. A perfect negative having been obtained, it is necessary to print off hundreds and thousands of copies on paper. The paper itself, and the materials with which it is prepared, as the albumen and the nitrate of silver, vary not a little in their action—vary, indeed, so much, that it is rare to get twenty copies of any individual photograph that shall be all alike. Worst of all, the materials used in the preparation of the prints contain within themselves the elements of destruction. The most important materials used in the preparation of paper for printing positives are albumen and nitrate of silver. A film of albumen lies upon the paper, and the surface of it is prepared with silver to receive the print, which is then submitted to various washing-processes in order to render it as permanent as possible. All questions of permanence, however, it is difficult to establish, and when we come to consider them, we are reminded of the wise youth mentioned in every Greek Delectus, who, hearing that ravens live a hundred years, kept one to see if it were true. Unfortunately, it is not necessary to wait so long in order to discover that the great majority of photographic prints are certainly doomed, and that the chances are against all in which silver and albumen are used. Nitrate of silver is so difficult to work, and so uncertain in its effects, besides being expensive, that men of science have long been on the look-out for some other metallic salt that would take its place. The nitrate of uranium has been tried, the ammonio-citrate of iron, the chloride of gold, and so on, but hitherto with little success. The nitrate of uranium seemed to promise permanence in the results which it gave, but these results were attained with great difficulty, and were only in rare instances of a fine quality.

The new process which has been discovered in Germany by Herr Wothly, and from him has been named "Wothlytype," discards nitrate of silver, and discards albumen. For the former it uses a double salt of uranium, the name of which is at present kept secret; for the latter it uses collodion. We have explained that by the ordinary method the paper to be printed is sized with albumen, and the surface of the albumen receives the silver preparation, which is sensitive to the light, and shows the printed image. The paper thus does not receive the image, but is, as it were, a mere bed on which lies the material that does receive it. By the substitution of collodion for albumen a different result is reached. In the first place, the film of collodion on the paper yields a beautiful smooth surface on which to receive the image, and the result is that pictures are printed upon it with wonderful delicacy. In the second place, the collodion before it is washed upon the paper is rendered sensitive by being combined with the salt of uranium. The sensitiveness, therefore, is not on the surface alone of the collodion-film, it is in the film itself, and so completely passes through it, that, even if it be peeled away from the paper, the image which it received will be found on the paper beneath. The vehicle thus employed is not less superior to all others yet known for printing the positive image on paper than it is to all others yet known for receiving the negative image on glass. The metallic salt which combines with it has also rare merits. In the first place, the manipulations are very simple and easy—far more so than in the silver-printing process, and thus the labour saved is considerable. Next, the paper, when rendered sensitive for printing, or "sensitized," as the photographers say, keeps perfectly for two or even three weeks—an immense boon to amateurs, who can thus have their stock of printing paper "sensitized" for them; whereas at present, when the paper receives the sensitive preparation, it has to be used almost immediately, and will not keep more than a day or two. Thirdly, the colour and tone obtained are very various, including every shade that can be got by the ordinary silver plan; but, in addition, it has the advantage of being able to print any number of impressions of exactly the same colour, and of doing away with all such difficulties as show themselves in mealiness and irregular toning. The precision of result is a great point. By the silver process the results are never certain, and even when a print comes out perfect from the frame the subsequent processes of washing and fixing go seriously to alter it. Lastly, the permanent character of the new method is very remarkable. Nobody seems to know exactly why the old silver process gives way—whether it be on account of the albumen, or the nitrate of silver, or the hyposulphite of soda. We only know that so many of the prints prepared by the old method fall away that no reliance can be placed in those which seem to stand firm. We know how apt silver is to tarnish, and especially in atmospheres that abound in the compounds of sulphur. Some photographers seem to think that it is this sulphur which does havoc to their labours. Whatever it be, ordinary photographs fade or darken, or in some way alter, and give us little hope of the fixity of those which still hold good. If it is the sulphur of the atmosphere or the albumen that does the mischief, then this which tells so much upon silver has no effect upon uranium; and the images pictured on paper prepared with uranium and collodion give every prospect of lasting as long as the material holds together. These pictures have been exposed to sun and rain for weeks together, and give no sign of alteration. Water seems to have no effect upon them. We have seen them spit upon, as a schoolboy spits on his slate and rubs it dry, and after this rough process they showed no sign of difference.

The "Wothlytype" presents some other advantages on which we need not now dwell. Its chief excellencies are those we have mentioned,—that it works with exceeding ease; that it is certain in its results, the impressions being all alike; that the sensitive paper will keep for weeks ready for use; and that when it has received the printed image it will stand an amount of tear and wear, and wind and weather, which no other photographs will bear. The process has been purchased from its German inventor by a photographic company, of which Colonel Stuart Wortley is the chairman. Colonel Stuart Wortley has long been known as one of our foremost amateur photographers. Some of his instantaneous pictures, especially his pictures of clouds, are among the finest things yet achieved in photography. As the chairman of a company which calls itself "The United Association of Photography (Limited)," he advised the purchase of the "Wothlytype," and has secured the patent rights of it as far as this country is concerned. How the company will use their patent it is for themselves to determine; but hitherto patent rights in connexion with photography have been so difficult to maintain, and the progress of the art so swiftly renders them null, that it is to be hoped they will see the wisdom of liberality, and give licences to use their patent on easy terms.

A word as to the manner in which notice was first drawn to the process will not be uninteresting. Mr. E. King Tenison, one of the directors of the company and an experienced photographer, passing, a few months since, through Aix-la-Chapelle, was struck by the artistic beauty of some photographs which were there exhibited. They also attracted the attention of Mr. W. Warren Vernon, another director, who was so struck with the peculiarity and superiority of the specimens that he secured and conveyed them to London. The result was that Mr. Brown, secretary to the company, one of the earliest workers in photography, and well versed in the mysteries of chemistry, was requested to proceed to Aix-la-Chapelle, communicate with Herr Wothly, investigate the entire matter, and report the result. The report was favourable, and, upon receipt of it, the directors, feeling that so very valuable an invention should be realized with as little delay as possible, confided the further necessary inquiries to the chairman and Mr. Vernon, who were empowered, if they thought fit to do so, to purchase the right to use the process in England. These two gentlemen accordingly proceeded to Aix-la-Chapelle, remained there a fortnight, studying the chemistry and details of the process, acquired a perfect knowledge of it, and, before their return, had secured the right, which has since been patented. First impressions have been confirmed by subsequent experience. Some of the pictures produced were exposed for weeks together to sun and rain without any sign of damage, and the expectations of Colonel Stuart-Wortley (himself a photographer of rare attainment and great practical experience) and of his brother directors have been more than fully realized.

It is now possible to secure "instantaneous" sun pictures really worthy of the name. The "down express" may be arrested as it goes tearing and shrieking on the wings of steam, the hissing shell may be transfixed in its deadly course, and the boisterous mirth and indescribable confusion of the road to the Derby may be enjoyed by those who have never witnessed the cockney carnival. So far for the inconceivable rapidity which can be attained by this process. Durability, the next great essential, may also be confidently promised, and family portraits may be handed down to the third and fourth generation, the limit in all likelihood being the durability of the material on which the picture is printed. The beauty and delicacy of detail and tone of the pictures will be admitted by all who inspect them at the offices of the company in Regent-street, which are open to visitors. It should be added that licenses to use the process are about to be granted by the directors to photographers on liberal terms.

⁂ A series of specimens will be laid on the table at the first Meeting of the Society, on Tuesday, November 1st.

MEMORANDA

(*Photographic, Scientific, and Practical*).

Dating Photographs.—An excellent suggestion is made by a writer in 'Harper's Monthly Magazine,' an American periodical. He says, "Everybody, writes a friend at the West, has his picture taken; and since the photograph is so cheap and universal, everybody will always continue to have it taken. If the invention had been earlier, every old house, museum, palace, castle, and cottage would be full of old likenesses; and among them would be the photograph of Luther when he left his father's house for the University, and one at Worms, later in life; one of Shakspeare, given to Miss Hathaway during their engagement; one of Bonaparte when at the military school; one of Washington when he returned from his western survey; there would be one of Abraham Lincoln taken at Mississippi village where his flat boat was detained a day. But could we identify these pictures? *Not one in a thousand would have on it the name and the date.*

"This is the pregnant text upon which our friend is sure that the Easy Chair could preach two or three columns. But it preaches itself. It is so obvious a duty that we should hope it needed no enforcing, although we know very well that it is a duty often, and perhaps generally, left undone. We say that it needs no enforcing, because, when fully stated, no argument or appeal can strengthen it. If you, good reader, when you next have a card taken, which you privately think is a caricature of your face, will write your name and date upon it, you will really increase its value. And to enlarge the exhortation, please also date exactly all your notes and letters. It is not enough to write Thursday, or June 20th, at the top or bottom. That kind of date has no meaning next year or the year after, and it costs very little trouble to put the figures of the year. The whole subject, brethren, falls under the general head of method and order. A very little care would convert a slattern into a neat Phillis, and a shuffling, shambling, confused, and lazy conduct into a prompt and effective one. A place for everything, and everything in its place, is one of the earliest copies upon which we all exercise our powers in pot-hooks. But it is a safe and saving legend for the whole of life. Precision is a habit as well as an instinct, and, like all habits, it can be cultivated and cherished. Date your notes; date your photographs, and put your name upon them; keep your papers, your letters, your bills in order, and you will save time, temper, trouble. So mote it be."

Purifying Ether and Alcohol.—In a recent number of 'La Lumière,' M. Gaudin has some interesting practical observations upon the rectification of ether and alcohol, from which may be deduced a process for the extraction of these liquids, in a pure state, from spoilt collodion. The object of rectification is to deprive the ether and alcohol of the acid and water they contain; therefore they are distilled in presence of the most powerful alkalies—quicklime, potassa, and soda at their maximum dryness. Their action is often incomplete, and, if they absorb the acid, they do not act sufficiently as hygrometric substances: we must therefore introduce into the circuit of tubes some fused chloride of calcium. This substance, when pure, is of very high price; besides, it is capable of reacting chemically upon the liquids distilled. M. Gaudin proposes to substitute plaster: the alcohol or ether is rectified by adding 1 per 100 of quicklime and 10 per 100 of baked plaster of paris; after intimate mixture, the distillation is proceeded with. The liquid to be distilled is put into a retort, which for ether will remain of the surrounding temperature; or if for alcohol, the retort is immersed in hot water, and the receiver in ice or freezing-mixture.

Photographs on Enamel.—M. Guillemère communicates to 'Les Mondes' a process of producing photographic enamels based upon Poitevin's discovery of the photographic properties of perchloride of iron, which in the presence of organic substances becomes moist when exposed to sunlight. He says:—

"The enamel, upon which I place the pigments mixed with suitable fluxes, and which must give all the details of the negative, is composed, in weight, of

Silica	3 parts.
Nitre	2·5 „
Flux	4 „

The flux is obtained by forming an alloy of three and half parts of lead and one of tin, which is calcined in the open air, in order to completely oxidize the metals until they are reduced to an impalpable powder. Moreover, I reproduce with the same facility portraits, engravings, and architecture upon hard porcelain, glass, and crystal.

"The objects covered with the photographic proof are, after complete desiccation, exposed in muffles to such a temperature that the oxides are converted into silicates. I put sufficient flux with the pigments to glaze the enamels. I perceive many advantages in this; the details come out better, the pictures acquire great softness and delicacy, and a brilliancy that pleases generally; and they are protected by the glaze against external agents. I do not trouble myself about the curvature of the surfaces: it is a matter of indifference to me whether the surfaces are plane, concave, or convex; there is no distortion in the pictures."

The Originators of the Collodion Process.—The Editor of the 'Photographic News,' in reviewing Mr. Archer's Manual, published in our August number, is disposed to divide the honour of the discovery of the Collodion process. He says:—"Regarding the origin of the process, we think the claims of Mr. Archer, as the practical discoverer, are pretty well settled. That it had been suggested and even tried before his experiments there can be little doubt; we believe that Mr. Bingham, now of Paris, was one of the earliest experimentalists in that direction. If we remember rightly, he was at that time an assistant to Professor Faraday, and was engaged in the earliest experiments in which collodion was produced. Being at the same time a photographer, he employed the new material in some of his photographic experiments. Unfortunately we have but a meagre record of them: the earliest allusion to the matter was, we believe, in an early edition of his work on 'Photogenic Manipulation,' dated 1850. In this work we find, amongst other processes on glass, a method almost identical in detail with Archer's. It consists in obtaining pictures with isinglass, by iodizing a solution of it with protiodide of iron, coating a plate of glass with the warm solution, and, when set, immersing it in a solution of nitrate of silver. After exposure in the camera, which sometimes produced a slight visible image, the picture was developed with a solution of protacetate of iron, and fixed with hyposulphite of soda. After describing this process, Mr. Bingham gives other substances which he has been able to substitute for the isinglass, and which, as he says, 'answer moderately well.' These substances are vegetable gluten, *collodion*, several of the gums, &c. This, it should be borne in mind, was published in January 1850, upwards of twelve months before Mr. Archer's first publication. Mr. Archer, however, first brought the matter to a practical issue, and gave the process to the public in a definite form; and with his name the discovery will always be mentioned. It should not be forgotten, however, that the process was thus far detailed before his discovery, nor that in his early experiments he had associates. To Dr. Diamond, as the first who produced presentable collodion photographs of which we have any specimens in existence, is also due, in a degree only second to Mr. Archer, the honour of the practical discovery of the collodion process."

Photogenic Qualities of Chloride of Copper.—At a recent Meeting of the Berlin Photographic Society, M. Grüne has described some interesting experiments on the photogenic properties of chloride of copper. He observed that a copper surface, when cleaned with hydrochloric acid, rapidly tarnishes even after being well washed with water, and it never acquires as much brilliancy as when cleaned with sulphuric acid. This fact had been known for a long time, but no one attributed it to the influence of light. M. Grüne having repeated this experiment several times upon ordinary kitchen utensils, thought one day of preparing a copper plate in a similar manner, exposing it to the direct rays of the sun, and covering it with an engraving. After a few minutes' exposure, the design appeared on the copper as a negative, and remained visible on the plate for an hour exposed to diffused light, but gradually faded. Repeated experiments satisfied the operator that commercial hydrochloric acid is preferable to that chemically pure. Other experiments, confirming the sensibility of chloride and bichloride of copper, permit M. Grüne to establish the following principle:—If we mix a concentrated solution of sulphate of oxide of copper (blue vitriol) with a solution of bichloride of zinc, a milk-white precipitate of perchloride of copper is formed, *which blackens when exposed to light*. This precipitate is sensitive only as long as it remains moist: it loses this property upon drying; and pictures obtained with it fade as they dry, and no means have yet been found of fixing them. It is very much to be desired, however, that the photogenic properties of chloride of copper may be rendered available to the photographer; for if this metal could be substituted for silver, an immense economy would be effected.

New Accessories to Sensitiveness.—M. Kaiser, in a French contemporary, says:—"Led by the remarkable discovery made by M. Poitevin, that tannin converts iodide of silver, which is insensible to light, into a very sensitive iodide, the idea occurred to me that there are many vapours or gaseous bodies which exercise the same influence upon iodide of silver. The employment of a gaseous body or vapour in lieu of a liquid has naturally many advantages in the preparation of dry plates according to a method similar to that recommended by M. Poitevin. Incited by his discovery, I have for some time occupied myself with the subject. The result of my experiments is, that the vapour of benzine changes insensible iodide of silver into a very sensitive iodide; and since it was my conviction that the ozone developed by contact of the vapour of benzine with atmospheric air was in this case the exciting body, I have made some experiments in this direction with air ozonized by a galvanic induction apparatus, and I have found that the ozone acts like the vapour of benzine, but infinitely stronger. Thus ozone must be regarded as the active agent in all substances which possess the property of changing insensible iodide of silver into sensitive iodide."

Poisoning by Cyanide of Potassium.—In a recent case of poisoning, Dr. Letheby gave his opinion that, from the presence of sulphocyanogen and potash in the stomach, cyanide of potassium, a deadly poison, was the substance taken. Its active principle is prussic acid. The 40 grains of potash found in Mrs. Gribbin's stomach would represent 3 grains and one-tenth of cyanide of potassium, the commercial article being impure, and containing only about 20 per cent. of cyanide. That quantity would be quite sufficient to cause death. The decomposition of the stomach would fully account for the fact that no cyanide of potassium was actually found, for decomposition had the effect of dissipating it. All the appearances were those of death from poison. Cyanide of potassium is much used by photographers, and it is one of the poisons most easily procured. Dr. Letheby said that he had had to examine many cases of poisoning by means of that drug.

Enamelling Photographs.—A method of giving a very highly glazed and waterproof surface to photographs has recently attracted considerable attention. A patent has been applied for in this country for one method, and a Spanish photographer has sent circulars by post to many English photographers, enclosing a specimen of the results of a similar process, offering to teach the process for £5. The process is simple, and consists in applying a coating of gelatine and collodion to the print. Mr. Tunny describes the mode of manipulating, in a contemporary, as follows:—

A sheet of glass is cleaned and coated as an ordinary collodion plate, only the collodion is uniodized and rather of the tough than the powdery quality. An ounce of gelatine, having been soaked for a few hours in twelve ounces of water, is now boiled in an earthenware jar, and the white of an egg added to it to clarify it. It is now filtered, while warm, through a piece of flannel. The gelatine is now ready to coat the collodionized plate, which is done by pouring sufficient on the centre of the glass and carrying it to the edges by a slip of paper. After moving it to and fro for a few seconds, it is drained into another vessel, so that it may be used again; but it must not be returned to the stock-jar, as it may carry dust with it. Any number of glasses can be prepared in this way. As they drain, lay them on a level bench or table.

After they have set so as to feel a little "tacky," take your prints, which have been thoroughly washed, lift them from the tray of pure water, and lay them immediately on the prepared plate; this is best done by lifting the print in a horizontal way, letting the edge of the print fall on the edge of the glass, and by a gentle pressure let the print gradually come into contact with the glass; the water will flow before the print, which entirely prevents the formation of air-bubbles. The prints can be also put down dry, but the chances of air-bubbles is much greater.

Eight "cartes" can be laid down on a plate 12×10. I find it better just to lift the "cartes" from the water and lay them down as described. For some large sizes, I have found it very easy first to lay the glass on a levelling-stand, then cover the gelatine with as much water as it will carry, lay the print thereon, which will float; take hold now of two corners of the glass, pressing with the thumb the print into contact with the gelatine; lift the glass gently to an angle; the water will flow off, leaving the print in perfect contact, and generally without an air-bubble; but if there should be any, they are easily seen by looking at the opposite side, when a gentle pressure of the finger will lead the bubble to the side. When dry, which generally takes about eight or ten hours, they can be separated by passing a knife round the edge of the glass and lifting the whole. Then mount in the ordinary way.

I prefer, when it is possible, having the prints all trimmed before laying them down on the glass, so that I can paste the back of the print and lay the board on before removal from the glass; by this mode, the surface is much more perfect than when the print is removed and then mounted.

For lockets and "cartes" I have found the above process produce exquisite delicacy.

Diamond Cameo Portraits.—A new style of portrait has recently been registered by Messrs. Window and Bridge under this name; they are described as follows:—The size is the same as that of the card picture, the cost of production is no greater, whilst in beauty, likeness, variety of interest, and force of effect it is superior to most phases of portraiture. The card contains four portraits, each giving a different view of the face. Each portrait consists of a bust about an inch long, and three-quarters of an inch wide; two are side by side in the middle of the card, and two at the top and bottom. The top and bottom generally consist of a front face view and a three-quarter face view; whilst the others consist either of two entire profiles, one of the left and one of the right side of the face, or of a profile of one side and a five-eighths view of the other; but of course much variety in this respect is possible. But the especial peculiarity, and that which gives the cameo effect of the picture, is yet to be described. The oval containing each bust is punched into relief, so as to have a convex surface. The effect of this, in giving the illusion of roundness and relief to the whole image, cannot be readily imagined by a person who has not seen it. It is difficult at first glance to believe that the features have not a special relief of their own, and the cameo effect is perfect.

Stamps on Photographs.—The tax on photographs, in the United States, has just come into operation. All photographs of every kind, except reproductions, have to bear a stamp, no matter how it may disfigure the picture. The amount is two cents for all pictures under a quarter of a dollar, three cents up to half a dollar, and five cents up to a dollar, with five cents more for every additional dollar and a fraction of a dollar. This is practically a tax of 5 per cent., or more, upon all photographs. Reproductions are not stamped, but charged 5 per cent. upon their price. The tax is levied upon the cost of the finished picture, frame and glass included, notwithstanding that the frame has already paid its specific tax before it comes into the photographer's hands; and it is also levied on the colouring or painting of the photograph, notwithstanding that painting in itself is not taxed at all.

Action of Light on Plants.—M. Boussingault has recently laid the result of a highly interesting series of experiments on vegetation before the Academy of Sciences. The most important fact is, that while plants when exposed to light fix carbon, hydrogen, and oxygen, when placed in darkness they eliminate these elements.

Relative Sizes of ultimate Atoms.—Professor Gustavus Hinrichs, of Iowa State University, communicates to *Silliman's Journal* an article on the distribution of the dark lines in the spectra of the elements, in which he reasons from the few facts yet known that these lines will probably be found at regular intervals in their spectra. He concludes that the lines must be produced by the bulk of the particles or atoms, and that an exact knowledge of the laws and distances of their distribution must lead to a knowledge of the relative dimensions of the atoms themselves, in length, breadth, and thickness. He remarks:—"Thus optics will give us the form and size, as chemistry has given us the weight, of the atoms."

To Varnish Articles of Iron and Steel.—Dissolve ten parts of clear grains of mastic, five parts of camphor, fifteen parts of sandarach, and five of elemi in a sufficient quantity of alcohol, and apply this varnish without heat. The articles will not only be preserved from rust, but the varnish will retain its transparency, and the metallic brilliancy of the articles will not be obscured.

MISCELLANEA.

Copyright Portraits.

CLERKENWELL.—Mr. J. F. Daniells, photographic artist, of 8 Regina-road, Tollington-park, Holloway, was summoned before Mr. D'Eyncourt to answer the information of Mr. Alexander Lamant Henderson, photographic artist, of 49 King William-street, City, which charged him with infringing the copyright in the portrait of Franz Müller.

Mr. Maynard attended for the complainant, and Mr. Lewis, sen., for the defendant.

The facts of the case have already been fully reported, and the matter stood over for Mr. D'Eyncourt to take time to consider his decision.

Mr. D'EYNCOURT said,—This is a summons for breach of copyright. The 25th and 26th Victoria, cap. 68, vests the copyright in photographs in the authors thereof, with certain exceptions and provisoes; and the main question is whether the complainant is entitled to the copyright in this photograph, or whether the proviso prevents his claim. Mr. Lewis took an objection that the Act was not intended to apply to photographs of this description. I see nothing in the Act to support that objection. It appears to me to apply to photographs generally. Had it been intended that the Act should not apply to photographs of individuals, an exception to that effect would have been inserted. With respect to the objections made to the entry in the register, I am inclined to think that neither of them are valid objections to the present proceedings; but I will come to the main objection raised on the part of the defendant, and founded on the proviso in the 1st section of the Act, viz. that this was a photograph "executed on behalf of another person for a good or valuable consideration, and that the copyright was not reserved to the author by agreement in writing, signed by the person on whose behalf the same was executed." As I understand the facts of the case, Müller requested the complainant to take his photograph. The first attempt was not approved, and the complainant made a second attempt. Eventually Müller preferred the first to the second photograph, and took five copies of it, for which he paid 5*s*. Now there can be no question, I think, that the complainant executed both photographs for Müller, and it is admitted that the copyright was not reserved by any agreement between him and Müller. The complainant, however, says that it was not executed for a good or valuable consideration, and therefore the proviso is not applicable. Now it is clear that the photograph in question, which is the second that was made, and was afterwards rejected by Müller, was made at the request of Müller; and the only question is whether any consideration passed for the work so done. Mr. Lewis says that the mere sitting and the time occupied was a consideration; but, without deciding that point, I think the 5*s*. which he paid was the consideration for all that was done. The photographer made two attempts with the view of satisfying his customer; and although Müller selected only one of them, the payment was the consideration of the labour of the artist—the consideration for both attempts. I think, therefore, the copyright in the photograph is not vested in the complainant, and must dismiss the summons.

Mr. Warren De la Rue, Mr. Balfour Stewart, and Mr. Loewy are engaged in a series of important investigations, embracing a variety of interesting views connected with the physics of the sun, these views being derived partly from a discussion of the photographic pictures obtained at Kew, and partly from considerations wholly distinct from the results of photographic observations. Mr. Carrington has, also, recently placed at the disposal of these gentlemen his observations made at Red Hill during a period of seven years. It is expected that some light may thus be thrown on terrestrial meteorology, and possibly also on molecular physics, by the labours of these ardent workers in science.

The Council of Administration of the Society for the Advancement of Industrial Art in Paris announce that the 'Palais d'Industrie' is placed at its disposal for organizing an Exhibition of the progress of industrial art, including photography. Further particulars will be announced shortly.

It has been resolved at the Horse Guards to employ the various drummer-boys, buglers, and other lads attached to the Royal Engineer Establishment, Chatham, in some one or more of the trades followed by the Royal Engineers, and so train them up to become skilled workmen. Each to be allowed to select the trade in which he is desirous of being employed, as now practised at the Royal Engineer establishment, including photography, printing, engraving, &c.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

G. B. W.—The copies of Mr. Robinson's "Bringing Home the May" will be ready for distribution to Members at the first Meeting of the Session.

J. F., Dundee.—You will find a notice of the subject in our present Number. The process is at present a secret; but we shall publish the details when they are made public. The results are fully as beautiful as described. You will find much information on the early history of uranium printing, and the various experiments made, in the back volumes of this Journal.

M. F.—There is still a demand for good stereoscopic pictures, but much less than at one time prevailed. We cannot advise you as to a publisher for your photographs.

B. J. L.—Members joining the Society at the next Meeting only pay half a year's subscription, in addition to the entrance fee. The Annual Meeting is in February.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 151. NOVEMBER 15, 1864.

PHOTOGRAPHIC SOCIETY.

The next Meeting of the Session will take place at King's College, on Tuesday, December 6th, at eight o'clock, when Mr. Jabez Hughes will read a paper, entitled "Some Remarks on the Tannin Process," illustrated with Negatives and Prints; and Mr. Henry Cooper, Jun., will read a paper "On Printing with the Salts of Uranium."

Members may now obtain the photograph of "Bringing Home the May," on application to Mr. Mattress, at Messrs. Taylor & Francis's, Red Lion Court, Fleet Street.

Meetings of the Society, 1864–5.

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	"	April	4
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LONDON PHOTOGRAPHIC SOCIETY.

Ordinary General Meeting.

King's College, London.

Tuesday, November 1, 1864.

J. Glaisher, Esq., F.R.S., in the Chair.

The Secretary read the Minutes of the preceding Meeting, which were confirmed.

H. Oakley, Esq., was duly elected a Member of the Society.

The Chairman called attention to a series of photographs of microscopic objects by Dr. Maddox, which were exhibited by Mr. How. They were, he thought, the best photographs of the kind he had ever seen. Photographs of microscopic objects had hitherto generally been failures; but these struck him as being really the finest in the world. If Dr. Maddox were in the room, it would be very interesting if he would give the Meeting some details of the method by which such beautiful results were obtained. If he were not present, possibly some other evening he would do so, as it could not fail to be interesting to Members to know how to produce such excellent results. He would recommend any Member who happened to have a lens with him to examine the prints carefully, as they would well repay such an examination.

The prints having been examined, and a vote of thanks to Mr. How passed,

The Chairman said that it was always gratifying, in the absence of a paper, to have specimens to examine; they then had something for the eye, if not for the mind. But he was not at all satisfied with the position of the Society. He did hope that every Member would put his shoulder to the wheel to produce a better state of things. He was deeply grieved when, after a long vacation, he was informed, in answer to his question, "What was the paper for the evening?" he was answered, "None whatever." He had hoped that the Meeting would have been favoured with some of the details of information and experience gathered during the summer's labours. He would ask every Member personally to do his utmost to alter this state of things. He hoped that in future the Secretary would receive many papers, and that the Society would occupy a better position.

The Chairman then said that he had received a letter from Mr. Peter Le Neve Foster, calling the attention of Members to the proposed International Exhibition to be held at Dublin during next year. Photography was to be represented there—pictures in the Fine-Arts class, and apparatus amongst Philosophical Instruments. He hoped photographers would aid in securing a proper representation of the art. He also called attention to some fine specimens of landscape-photography by Mr. Brownrigg, Hon. Secretary to the late Dublin Photographic Society. He further called attention to some very fine enlargements exhibited by Mr. Dallmeyer, who would perhaps favour the Meeting with some details regarding them.

Mr. Dallmeyer said the specimens were by Dr. Van Monckhoven's new enlarging apparatus, which had been described in the journals; and he need not now detain the Meeting with details. He thought, on an examination of a print from the original negative, 4 in. × 3 in., of an architectural subject, and then at an enlargement of ten diameters, it would be seen that the results were very good—better than could have been obtained with a large lens direct. One especial point worthy of note was the entire absence of touching in any of the prints: they were untouched examples of what could be produced by this apparatus when a suitable negative was used. The chief peculiarities in this apparatus were the forms of the condenser and enlarging-lens.

The Chairman, in proposing a vote of thanks, said that these were undoubtedly the finest examples of enlarging which he had seen. He called their attention to a fine and large example of landscape-photography by Mr. Samuel Fry, with well-marked clouds. He also called attention to some enamelled specimens exhibited by Mr. Squire, who would perhaps explain details.

Mr. Squire said that the specimens were ordinary photographs treated, after finishing, by Mr. Rollason's patent enamelling material. A great improvement was effected in the appearance of the picture; and, by being protected from atmospheric action, the permanency was increased.

The Chairman, after presenting a vote of thanks to Mr. Squire, called attention to specimens of the diamond cameo portrait by Messrs. Window & Bridge, and invited Mr. Window to explain details regarding the specimens.

Mr. Window said that the photographs were taken in the usual manner, in a camera provided with proper movements for taking the four heads in their proper positions. His especial object had been to get rid of the vulgarity which too often attached to the ordinary card picture, and by the facilities which such a method offered to obtain easily a good expression. The convex form, as would be seen, added much to the effect of relief. Under the best of circumstances the ordinary card picture was often vulgar, because, to avoid this, it was not only necessary to have an artist photographer, but an artist sitter. By adopting simply the classic head, and this form of treatment, he thought something higher and more artistic was obtained than had been secured hitherto in portrait-photography.

The operation of producing the pictures was simple and rapid; and the best part of a large lens being used in just securing a head ensured the best result in this respect.

The specimens, together with a camera arranged for producing the negatives, by Mr. Dallmeyer, were then examined. After a vote of thanks,

The Chairman called attention to the beautiful specimens of the new method of printing which were on the table. They had hoped to have further information on the subject that evening from either Col. Stuart Wortley or Mr. Brown, the Secretary to the Association, but were disappointed. The Secretary would, however, read some letters on the subject.

The Secretary then read the following letter from Mr. Brown:—

"The United Association of Photography (Limited),
"213 Regent Street, London. W.
"Nov. 1, 1864.

"Sir,—The directors of this Company have had, as you are aware, the opportunity to-day of consulting the editors of the photographic journals. They invited them, as representatives of the photographic public, to discuss certain points in connexion with the Wothlytype patent. They have naturally considered the suggestion made by each; and the directors now wish to announce that they have resolved to adopt the following modifications regarding the licences for the process:—

"They propose to license professional photographers, at a sum of ten guineas each, to manufacture and use the chemicals required for their own practice for the whole term of the patent.

"They propose to postpone opening their studio in Regent Street till December 1st, and in the meantime, from Monday next, show the working of the process in Regent Street to every licensee, so that he may make himself thoroughly acquainted with the manipulations and advantages of the process.

"To amateurs they wish to act as liberally as possible, consistently with the duties the directors owe to their shareholders; and the terms will be announced in the journals of this week*. "I am, yours truly,
"Wm. Brown.

"*Dr. Diamond,*
"*Secretary of the Photographic Society.*"

The Secretary then read the following extract of a letter from Mr. Tunny, the well-known photographer of Edinburgh:—

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* Amateurs are now allowed to practise the process without any restriction whatever.—Ed.

"I have been all out of breath, so to speak, in anxiously waiting the disclosure of the 'Wothlytype,' but I suppose we are destined to remain somewhat longer in suspense. In the meantime I have not been idle; I have been endeavouring, if possible, to ascertain what can be made of uranium, as that is the hinted-at salt, in combination with other metallic compounds. I have, in the first place, got very vigorous prints by the nitrate of uranium and chloride of gold—also good results with the uranium and silver; perhaps as good as any have been the result of the ammonia phosphate of silver: all these, and many others that will suggest themselves, give very vigorous prints, simply combined with collodion; but there is the drawback of want of sensitiveness, taking nearly double the ordinary time to print; however, the weather has been very bad for conducting my experiments.

"I cannot, as yet, give the definite formulæ for the above, as I have used them in every conceivable proportion; but if any of your readers will take, firstly, half an ounce of spirit of wine, add nitrate of uranium (as much as it will dissolve by long and continual shaking), now add half an ounce of ether, three grains chloride of gold, and six grains of gun-cotton, they will have a collodion that will print by its being simply poured over a sheet of paper laid upon a piece of glass. The prints are fixed by being placed for a few minutes in a bath of water slightly acidulated with nitric or oxalic acid.

"Secondly: The phosphate of silver being dissolved with the smallest quantity of ammonia, just sufficient being added to redissolve it, added to ordinary plain collodion, in the proportion of six grains to the ounce, makes a very sensitive printing-collodion.

"Thirdly: Nitrate of silver three grains, dissolved in a drop or two of distilled water, added to the first or uraniumized collodion, *without the gold*, also makes a good printing collodion.

"If the above be at all suggestive or of any use to the readers of the Journal, they are at your disposal. When the weather clears up, I shall follow up these experiments; and if anything turns up, I shall be glad to let you have a few notes."

Mr. **Peter Le Neve Foster** said the prints before them were no doubt very beautiful; but time alone could determine how long they would last.

The **Chairman** said that, in regard to the permanency, it might be interesting to state that he had examined, that evening, a uranium print taken two years ago, which was as bright and perfect as when it was produced. He now called the attention of Members to the very beautiful photograph which was ready for distribution amongst the Members as a presentation print.

A slightly reduced copy of Mr. Robinson's composition, "Bringing Home the May," was then distributed to each Member.

The **Chairman**, recurring again to the state of the Society, stated that it required more life and activity infused into it. So far as he could, and so far as the Council could, they would endeavour to give it that life; but this could not be done, unless Members also did their best. They would be glad to receive hints and assistance from all. This Society ought to be in position, as it was in history, the first in the world. Their Journal ought to be the best of its day. He should like to see it beat all the other photographic journals; and then, for the sake of photography, he would be glad to see them beat it again. He hoped every Member would address himself to the work of raising and keeping the Society in the position it ought to occupy. By a pull at once, and a pull all together, this might be. It ought to be done, and it could be done. Let all the Members collect and spread information in the proper way, and the Society would certainly prosper.

The Meeting was then adjourned until Tuesday, the 6th of December.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

First Meeting,

HELD IN

The Society's Hall, 117 George Street,

November 8, 1864.

Mr. **James G. Tunny** in the Chair.

The Minutes of the preceding Meeting were read and approved.

Mr. **W. D. Clark**, Merchiston Terrace, was balloted for, and elected an ordinary Member.

Mr. **Thomas Fox**, of Alloa, then read the following communication:—

New Method of Photographic Printing.

Gentlemen,—I beg to submit to your notice a process of printing without nitrate of silver; it is very simple, very rapid, and the ingredients required are of the cheapest, and at the same time it produces pictures very distinct, the shades of an intense black, equal if not darker than any known process, and which will not fade from ordinary exposure, from the known chemical combination of the materials used. It is the exact counterpart from printing with nitrate of silver, and whitens the paper where exposed to light, the shaded parts becoming black, and yielding very fine and soft gradations of tone when treated with the following simple process.

The process consists of bringing the bichromate of potass in direct contact with logwood; and the plan I adopt is to sensitize the paper with a solution of the bichromate of potass and sulphate of copper, mixed in the proportions of one part of the former to two of the latter, and to either float or steep the paper for a few minutes, then dry it by the fire in the dark (this paper will retain its sensitiveness for some days, if carefully preserved from light); you then place your copy to the sensitive side, if a glass transparency, with the printed side down, and with a paper print, either with the printed side down or the plain. With the printed side down you get a reversed picture, but which suits admirably for transferring. The time of exposure is much the same as in printing with nitrate of silver: in sunshine from one to three minutes is amply sufficient from glass, and for a paper print or piece of printing it will be rather longer, according to the thickness of the paper; the thinner it is the better. Of course, in dull weather it is proportionably longer; at the same time I would say, paper thus prepared is much more sensitive than the silvered, and will print considerably quicker.

I have then a strong decoction of logwood ready, and filter such a quantity as will float the print; I add a little hot water to hasten the development, float the sensitized picture from half a minute to a minute, print-side down, and then, holding it by one corner, gradually raise it from the logwood: a perfectly delineated copy is the result. I then dip it in hot water, which carries off the superfluous logwood that may be hanging to the paper, then dip it in hot or cold water, and varnish. This gives a very distinct picture, with the shades of a deep black, and the lights of a rather greyish-yellow tint. In order to obtain a white ground, I use a weak solution of alum, put in hot water.

The same logwood will do a great number of prints. The sensitizing solution retains its power until dried up. There is no danger of baths going wrong, as in the silver baths; and the tedious process of toning, &c., is avoided, not to speak of the great uncertainty and variations in these processes; and it will do all that the carbon process professes to do in transferring, &c. The whole process may be done in a few minutes: the paper, being sensitized and dried by the fire at once, may be immediately exposed, developed, and varnished.

For transferring the unvarnished print, I simply pass it under a roller-press, which gives a beautiful impression on albuminized paper, leaving the ground pure white; it also transfers to cotton, linen, glass, stone, wood, and any other material.

I may mention that by varying the strength of the sensitive solution, and the intensity of the logwood, many different shades of colour may be obtained, as you can get blue and purple, and deep black to the lightest shade of black. I see no reason why this process may not also be used in the camera, with an albumen or other transparent medium, using logwood as a developer.

I would also take this opportunity of mentioning that it is above a year since I first began these experiments, and made them with plain paper. Some of these I forwarded to your President, Sir David Brewster, who was kind enough to acknowledge them, and recommended me to continue these experiments. I found the plain paper did not clear in the lights well. I tried salted paper, which gave very good results, but still dark in the lights; I then tried albuminized paper, and as yet find it best; but I believe gelatine paper would perhaps be best.

It is, I believe, as yet by far the simplest and quickest process that has been brought out, consisting simply of this:—

1st. The sensitizing solution, easily made.

2nd. The logwood, equally so.

And in working these it is equally simple and sure. Float the paper for five minutes, or shorter if steeped; expose for a short time (observation will determine the time); then develope with logwood, and the whole operation is done, with the exception of varnishing, which is just poured over the picture. For this process I have obtained letters patent; and, from the pictures produced, I hope you will think favourably of the first results made public. I have no doubt they may be greatly improved upon further trial; and I trust that these my efforts may not altogether be unworthy of the notice of your Society.

Mr. Fox exhibited a number of prints, showing that by his process a great variety of colours and effects could be produced. At the conclusion of the paper, the Chairman proposed a vote of thanks to Mr. Fox for his important and instructive communication.

Messrs. Marion, Son, & Co., of London, exhibited a number of specimens of Messrs. Window and Bridge's "Diamond Cameo Portraits," which were very much admired for their novelty and great beauty.

The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in *giving the papers at length, do not thereby adopt the views or opinions of the authors.*

No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith.

The same proviso extends to communications to the Editor.

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Dublin International Exhibition, 1865.

Dear Sir,—I beg to enclose the particulars of the Dublin International Exhibition, and to request the favour of your bringing the subject before the Council of the Photographic Society, in the hope that the Society will help in getting a fitting display of the photographic art in Dublin next year. You will see that Photography is placed in "Division F," "Fine Arts," whilst the instruments and apparatus will be shown in "Class B," No. 10, "Philosophical Instruments."

As soon as I receive the actual regulations for the admission of photographs, some copies shall be forwarded to you.

I am, dear Sir, yours faithfully,
P. Le Neve Foster, *Hon. Sec.*
To the Secretary of the Photographic Society of London.

PHOTOGRAPHY.

[From the 'Quarterly Review.']

Importance of the Art.

Of all the marvellous discoveries which have marked the last hundred years, photography is entitled in many respects to take its rank among the most remarkable. It will not produce the same wide-spread effects upon the social condition of the human race that have been and will be the result of the steam-engine and the electric telegraph. It will not bring any such mitigation to human suffering as has been caused by the discovery of chloroform. But it occupies a position distinct from these in the perfect novelty of its results, and their more direct connexion with the world of mind. It is not merely an improved mode of doing that which was done before. Carriages were drawn, and shuttles thrown, and signals sent from distant points, before ever Watt or Wheatstone was heard of. But the work which Wedgwood and Boulton are supposed to have begun, and which Talbot and Archer perfected, has done a new thing. It has forced the sun, which reveals to our senses every object around us, to write down his record in enduring characters, so that those who are far away or those who are yet unborn may read it. It has furnished to mankind a new kind of vision that can penetrate into the distant or the past—a retina as faithful as that of the natural eye, but whose impressions do not perish with the wave of light that gave them birth. Photographs, regarded as evidence of that which they represent, differ in essence from any other species of representation that has ever been attempted. They are free, so far as their outlines are concerned, from the deceptive and therefore vitiating element of human agency. The work of the artist may be more beautiful, but it can never be so exact. Philosophers have pleased themselves with the fancy that the scenes that passed upon this earth thousands of years ago have not really perished; but that the waves of light which left the earth then are still vibrating in the illimitable distances of space, and might even now be striking, in some far-off fixed star, an eye sensitive enough to discern them. Supposing that photographs are preserved with reasonable care, the philosophic dream may be a reality to our remote posterity. Lord Macaulay's New Zealander, when he goes home from his perilous exploration of Great Britain, may gaze in some Antipodean museum upon a picture of the entry of the Princess Alexandra into London, traced not by some careless or courtly human hand, but by the very rays of light which were reflected from her face, and from the various persons and objects around her.

The Wide Extent of the Art.

There is scarcely a family of any class in the United Kingdom in which the likeness of well-loved features, guaranteed by the infallible sun, is not duly prized; and the enormous demand has created a corresponding supply. There is scarcely an educated lady, fashionable or unfashionable, whose table is not adorned with the album of *cartes de visite*, containing a full allowance of royalties, half-a-dozen leading statesmen, and a goodly row of particular friends—all highly useful in furnishing subjects of conversation to guests "gravelled for lack of matter." There is hardly a cottage in which a humble sixpenny "positive" does not recall, somewhat duskily perhaps, but still truthfully, the lineaments of some distant son or brother. To meet this demand a whole army of professional photographers has sprung into existence, working with very various skill and in very different social positions—from the few celebrated artists in the great capitals, one or two of whom are said to be in the receipt of incomes far exceeding that of the Archbishop of Canterbury, down to the travelling photographer in a covered cart, who may be found in the remotest villages of Scotland or Cornwall, and whose gains may probably be described in the most modest possible terms. By the side of this professional class has arisen, not so widely of course, but still with remarkable rapidity, a very zealous body of amateur artists. A number of photographic societies exist, composed in some cases of amateurs and professionals conjointly, in others entirely of amateurs. The chief of these societies is honoured by the presidency of no less a personage than the Lord Chief Baron of the Exchequer; on the committee of another figures the name of the Primate of England; and the other less learned professions are not less fully represented. Three or four photographic newspapers, conducted for the most part with great ability, complete what may be called the social apparatus of the art.

Its Application to Legal Purposes.

In judicial inquiries, not less than in scientific experiments or investigations, its incorruptible and infallible accuracy gives to its productions a value to which no work of human pen or pencil can even distantly approach. Governments have not failed to make use of it for purposes of criminal police. In some countries every person convicted of any crime is photographed, and the record of his features, duly multiplied, becomes part of the archives of every prison. Of course a hardened criminal, knowing the purpose for which his likeness is being taken, is not a very manageable sitter. But no choice is given to him: the room in which he is brought before the chief authority of the prison is so arranged that he is obliged to stand in a place where a good light falls upon him; and while he is being professedly examined, the concealed photographer does his work. The system has been introduced to some extent into England, but only very partially. It is to be regretted that the adoption of it has not been more general. The cost is quite trivial; and there is no other plan approaching to it in efficiency, for drawing that clear and certain line between new and old offenders which is absolutely essential to a sound criminal system. If every prison were armed with its photographic album, containing a pleasing collection of all the physiognomies which had ever been shorn of their flowing locks in any jail in the country, a ruffian out upon his third ticket-of-leave would not be able, as now, by the simple expedient of changing the field of his operations after every fresh conviction, to persuade the magistrates that he was an innocent, accidentally led away by drink. The plan has received the sanction of the Committee of the House of Lords upon Prison Discipline, which was presided over by Lord Caernarvon, and under the auspices of the same noble Lord has been introduced into Winchester Jail. It can never attain to its full utility until it has been universally adopted; and therefore, it is to be hoped that the magistrates of those counties which have not yet adopted it may be induced to do so by the recommendations of the Committee of the House of Lords.

But this is not the only service which photography is capable of rendering to the law. If Müller had never in an evil hour entered a photographer's studio, the link would have been wanting which so immediately connected him with the foreigner who entered Mr. Death's shop—pursuit might possibly have been delayed until it was too late—and he might have been by this time distinguishing himself as a rising Federal officer under the command of General Butler. An amusing instance of a similar kind, though in connexion with a less atrocious crime, occurred the other day. A thief bethought himself that it would be a good speculation in his way of business to steal one of a photographer's lenses, a kind of booty which would pay as well as a couple of dozen spoons. Accordingly, he went in to have his portrait taken, duly sat for it; and when the photographer retired to develope the plate, he walked off with his plunder in his pocket. Unluckily he had not reflected upon the consequences of the few seconds he had spent in front of the lens he coveted. The photographer had obtained a good likeness of him, and the means of identifying him were, of course, speedily placed in the hands of the police. An incident of the same kind plays an important part in the drama of the 'Octaroon,' which was so popular in London two or three years ago. The author, however, shows the popular ignorance upon the details of photographic manipulation. The culprit is detected in consequence of his accidentally committing his crime in front of a camera and lens, which a photographer had accidentally left there. The author apparently entertained the view that in all places and under all circumstances a camera and lens would take a picture of what passed before them, without the intervention of any sort of human agency.

Its Application to Science.

It is to science, however, that photography, the child of science, renders, and will unceasingly render, the most valuable aid. There is scarcely one in the whole list of sciences which is not largely indebted to it. Astronomy and microscopic observations have benefited singularly from the increased accuracy that has been secured. It is a boon of enormous value to be able in any instance to eliminate that fruitful source of error, the fallibility of the observer. Photography is never imaginative, and is never in any danger of arranging its records by the light of a preconceived theory. An instance of its utility in this respect was afforded by the great eclipse which took place some years ago. Much doubt existed as to the exact form of the curious protuberances which seem to shoot out from the sun's edge during the progress of an eclipse, and some controversy had even taken place as to whether they were not optical delusions. Such difficulties were easily adjusted by the production of an image of the protuberances in question upon a sensitive plate. In this case the use of photography is merely to correct the hasty inference which astronomers on the spot might form from an observation necessarily rapid, and taken under exciting circumstances. Its utility is still more conspicuous in the far more numerous cases where the observer and the scientific reasoner are different persons. Hitherto the man of science, in many departments, has been at the mercy of the unscientific traveller. The ethnologist, the historian, the antiquarian, and often the geologist have to form their theories upon data which have been gathered by a gleaner whose appreciation of the value of minute accuracy may be inadequate. It is seldom that the qualifications necessary for the successful traveller and the successful student combine in the same person. From time to time such a man as Alexander von Humboldt arises, but he is a phenomenon to be wondered at, not to be counted on. Usually the enterprising traveller is too eager, too self-confident, and too little qualified by intellectual labour to extract the best results from the observations he collects. His drawings are passed on to some scientific man at home, who makes out of them what results he can; but the traveller is pretty certain to have a theory of his own, and that theory haunts him through all his observations. It guides him in the selection of subjects which he will undertake the labour of designing, and it perches on the end of his pencil when he is at work. If a man believes that the leaves of the sacred tree in Thibet do bear alphabetical characters, his drawing will not fail to convey that belief to his distant readers somewhat more emphatically than the original. If he has a view of his own upon the connexion between Buddhist temples and Druidical remains, the conviction will make itself felt in the drawing. In matters of such delicate rendering as Egyptian hieroglyphics, Sinaitic carvings, Cuneiform inscriptions, the question whether this or that mark upon the weather-worn stone shall be recorded as the remains of a line or a dot, or shall be overlooked as a defect produced by age, will be decided, in the work even of the most conscientious draughtsman, by the interpretation which he places upon the symbols he is recording. Such inaccuracy in the observer generates a corresponding inaccuracy in the student who generalizes from his observations. The student knows how the observations are taken, and justly looks upon them as all more or less arbitrary and conjectural; he is ready enough, therefore, whenever he is hopelessly at a loss, to evade the difficulty by audacious emendation. After all, the error may have been only the copyist's doing, and the true original may be in favour of his view. The pictures of the sun are subject to no such damaging suspicions. The scholar studying in the British Museum may have before him in a photograph the hieroglyphics from Carnac, or the inscriptions from Persepolis, or the outlines of a Buddhist temple in Ceylon, not as they may appear after they have been filtered through the brains of an imaginative artist and his engraver, but as they actually are, traced by the hand of the same unerring natural law as would have painted them on his own retina had he been there.

Reproduction of Historical Documents.

There is one other application of photography to the purposes of science which is impeded by no difficulties of this kind, and the neglect of which, therefore, is capable of no similar defence. Students in all those branches of learning which depend upon manuscript records —the philologist, the historian, and, above all, the theologian—have reason to complain that it has not been more largely employed to secure from the risks of time the stores from whence they draw their knowledge. It is notorious that, for the scholar's purposes, a printed book is no substitute for the MSS. on which it is nominally founded. Very few editions even profess to reproduce with rigid accuracy any particular MS. The editor uses his judgment in making this or that departure from the ordinary text, and in recording it if he does so. And even where an exact copy is professedly given, it is subject to all the ordinary fallibility of human work. Each new collator who consults an ancient MS. finds a fresh harvest of corrections to be applied to his predecessor's labours. And, beyond this, there is much in every MS., in its arrangement and in the character in which it is written, which no printed book can, without enormous cost, bring fully before the scholar's eye. The MSS., therefore, from which our knowledge of ancient literature is drawn are still an inestimable possession, in spite of all the printed editions that have been drawn from them. It is a possession, it is needless to say, resting upon the frailest tenure, which war, or revolution, or accidental fire, or careless exposure to damp may at any time terminate. It is strange that, when science offers a guarantee against such accidents, the learned bodies or the governments of Europe have in so few cases made any effort to secure it. Both Sir Henry James and Mr. Osborne, of Melbourne, have shown that by the bichromate process any document can be unerringly and cheaply reproduced upon zinc or stone; and, so reproduced, any number of absolute facsimiles might easily be printed off. Or, to make the security of accuracy more perfect, they might be printed direct from the negative by the carbon process. Such a multiplication would have the double advantage, that it would place copies, indisputably accurate, of all important MSS. in every great European library, and it would make any risk that the originals might run, in this troublous age of the world, a matter of secondary account.

Its Claim to be considered one of the Fine Arts.

No one disputes the scientific value of photography; but when we come to its claims and position as one of the fine arts, we enter upon rather less peaceful territory. This is no matter for surprise, whatever the merits of the case may be. The ground is fully occupied. Any who claim a place in it must do so to the detriment of some who are already there. New comers are seldom popular with those whose room they occupy. And the feeling appears to be peculiarly bitter in cases where the old-established favourite has to give way to some new-fangled device, which has been introduced in the natural course of things, as the world advances. It is not surprising that bad artists should have lavished upon photography a good deal of the contempt which some thirty years ago coach-proprietors used to expend upon the dangerous and inconvenient system of travelling by railway. The penalty of being thought *parvenu* and illegitimate by those whom it supplants is a penalty which every new discovery must pay for its novelty, and which, perhaps, is a salutary ordeal to distinguish genuine improvement from wanton innovation. However, this standing jealousy of new favourites, which is always entertained by the old, is not wholly adequate to account for the zeal with which the claim of this upstart science to rank among the ancient order of the Fine Arts has been combated. There are many causes in operation peculiar to the case of photography. Among them must in justice be admitted the shortcomings of many of its professors—which, in other words, means the shortcomings of the multitude whom it is their function to satisfy. Whatever our merits as a nation may be, we are not distinguished as worshippers of the beautiful; and any art which appeals to the eye in England will by no means become more elevated in proportion as it becomes more popular. An art which is fortunate or unfortunate enough to attract but a scanty circle of educated admirers may maintain the loftiness of its standard unimpaired. But an art which lives by the patronage of the million will adapt itself to the million's tastes. In theatrical phrase, it will 'play to the galleries.' The enormous demand which has sprung up for photographs has produced a vast amount of detestable photography. The skill required for the production of a bad portrait is not beyond the reach of an ordinary artisan; and the small capital with which it is necessary to begin produces a rich and rapid return. The result of course is, that numbers are induced to take it up, and make a good livelihood by it, who work it in the spirit of simple mechanics. They practise it that they may live by it, and they ask from it no other result than that it should pay. Abundance of customers is the only ideal they pursue. That the works which such practitioners turn off should claim to be works of art is, no doubt, enough to raise the bile of any fastidious artist. But photography is not the only profession which includes both a high and low range of merit; and it is not the only one that would suffer in estimation if it were judged by the misdeeds of its hacks and drudges. It would be as sensible to condemn poetry because of Grubb Street, or to cashier Thalia and Euterpe from the rank of Muses on account of the musical and dramatic doings of the 'Surrey side.' The art must, in fairness, be judged by its ornaments, and not by its disgraces.

But there is a deeper cause yet which impedes the recognition of photography by the select few who know themselves as 'persons of taste,' and which must continue to do so for many years to come. Admiration is, to a great extent, a matter of education. In the case of far the larger number of people the eye admires only that which it has been habituated to admire. Want of practice will prevent the mind from dwelling on, and therefore, for all practical purposes, from seeing the beauties for which it has not been taught to look. It is not merely that rude and civilized nations will admire opposite qualities, and that the European and Chinese systems of painting are respectively unendurable to the people who have not been brought up to like them. But among the same race, and within the limits of no long period of time, the prevalent estimate of true beauty will veer almost from pole to pole.

The vigour of the Pre-Raphaelite and the Gothic movements, and the horror which both inspire in gentlemen above a certain age, sufficiently attest how violently taste has fluctuated even within the domain of the two staid and conservative arts of architecture and painting. It must often therefore of necessity happen that some development of art is disparaged even by the highest artistic authority, not because it does not possess capabilities of giving æsthetic pleasure, but because, by reason of novelty or of chance fashion, it meets with no eyes that have been educated to receive it.

It is not in the least degree likely that photography will ever dethrone painting from its present preeminence. The good painter's resources are so much larger, his power of interpretation so much freer, that he will always command more admirers than the best photographer. But it is likely that the admirers of photography will increase in number in proportion as the results of the art become more familiar. Its beauties are special to itself, and hardly come into competition with the true beauties of painting. The ground it occupies is limited; but on that ground it is unapproachable. But its excellence depends on shades of difference, which will seem large or trivial according to the familiarity of the observer. To an art-connoisseur of the present day the differences between good and bad photography appear inappreciably minute, for the same reason that the ease with which a huntsman recognizes his hounds apart, or a shepherd his sheep, seems inexplicable to an observer who has never had much to do with either. The magnitude of the intervals in a scale of merit is a purely subjective question. It depends entirely on the power of discernment which the observer's own mental experience and the current habits of thought of the world around him have given to him. Now painting has all the advantage in this respect which complete familiarity can give. It has been before the modern world for some five centuries. The merits which attach to pictorial representations of natural objects (putting aside the question of the ideal for the moment) have been familiar to fifteen or sixteen generations of admirers. The sensations of pleasure which are produced by effective composition and harmonious colouring have been felt by numberless minds, and have been so closely studied and analyzed, that the gradations of merit are easily recognized, and the minds of artists have become very sensitive to excellence. An ordinary connoisseur of the present day can detect defects and can feel beauties which would have produced but a dull impression on the mind of a contemporary of Cimabue. An art has not had a fair trial until it has had an opportunity of appealing from the neglect of one generation to the verdict of the next. It must educate not only those who are to practise it, but also those who are to enjoy it.

Time will do this service to photography. It is obvious that the want of colour will always be a great drawback. But it has much to offer instead, which, though not a full compensation, deserves to be rated higher than it is by many at the present day. The gradations of light and shade, and the exact form of the objects it depicts, are rendered with a delicacy and a fidelity which the painter cannot even approach. It is natural that these beauties should not be fully recognized by the mass of the art-critics of our day. They have not been wont to look for these things. The art with which they are familiar has not them to offer. The brush or the pencil are instruments far too rough to reproduce with truthfulness the beauties of form, and light, and shadow which Nature lavishes on every side, and those who have learnt all their canons of admiration from the works of the brush and pencil naturally pass such merits by in ignorance or contempt. The balance of light and shade, the exact adjustment of the prominence due to each portion of the picture, is a peculiar beauty of the art, which seems to attain to greater and greater excellence with each succeeding year. Those who talk of photography as something purely mechanical would be surprised to know how much the attainment of this excellence depends upon natural gift, adroit manipulation, long experience, and careful study of nature. As these qualifications are brought to bear on it more and more, it may be expected that finer results still will be obtained. Such results are as much the work of the artist who produces them, as the results that are produced on canvas. They depend quite as much upon individual skill and perception of beauty. The only difference between the two cases is that one artist works with brush and pigment; the other by timing his exposure, and by judgment in compounding and applying his developers and intensifiers. And the pleasure given is the same in kind. It appeals to the same sense of beauty. No reasonable person anticipates that the time can ever come when even the most exquisite transparency in monochrome will give as much pleasure as a first-class painting. But when the power which photography confers of dealing with light and shade has received the recognition which greater familiarity will procure for it, no one will deny its title to be ranked as a fine art.

Its exact rendering of natural form is more generally acknowledged. But it is a curious illustration of the extent to which the art of painting has had the opportunity of moulding public taste to its own necessities, that this exactness which the paint-brush and the pencil cannot attain has actually been made a reproach to the photographer. Some persons appear to entertain the idea that the superiority of a fine landscape-painting over a fine landscape-photograph is due, not entirely to its colour, but to the fact that the indistinct and faltering outlines do not distract the eye or turn it from the nicety of the entire design to the contemplation of minute detail; and, quite consistently, they treat the inevitable imperfection of the lines of a chalk or pencil drawing as a positive beauty. So far has this view been carried in a few cases, that some photographers have been found to prefer an old process called the wax-paper process, in which the negative was taken upon waxed paper, instead of upon glass, and in which consequently the positive print was disfigured by all the uncertainty of outline due to the confused texture of paper through which it is printed. To that extent it was necessarily rather more like an artist's drawing. In other words, it resembled an artist's drawing in its defects. But the word 'artistic' has a magic power; and there were many people at one time who were quite satisfied that they had settled the question, when they had decided that wax-paper was the more artistic of the two. Another curious mental confusion of the same kind in reference to portraiture still prevails occasionally under the influence of the same potent word. There are some photographers, and more photographic critics, who are of opinion that a photograph cleanly taken, and properly focused, is 'inartistic;' and if asked why they pass upon it this terrible condemnation, they will reply, taking refuge behind another word of power, that it is 'realistic.' The complaint is too vague to be liable to criticism. But the remedies are very curious, and betray how blind and unreasoning much of our connoisseurship is. One critic recommends that the sitter should move slightly while the portrait is being taken. That critic can never have stood behind a camera. The result of the nostrum would undoubtedly be to banish the realistic; but whether the effect would be artistic may be questioned. The simple consequence of the remedy would be that the sitter would be presented to the world with an elongated mouth, two noses, or one nose the size of two, and eyes squinting outwards. Another more popular remedy for this supposed defect is to throw the focus of the lens, not upon the sitter, but to a point behind him. This device, no doubt, effectually disposes of all undue exactness of outline. The lineaments of the unlucky sitter are invested with a blurred, hazy margin, which is presumably 'artistic,' but which makes him look much as a man looks who is standing a few feet off in a thick white fog. But this is not the whole of the metamorphosis which he has to undergo in order that he may be rescued from realism. All points which fall short of that to which the lens is focused are not only blurred in outline, but exaggerated in dimensions, and that in proportion as they come nearer to the lens. The consequence, therefore, of throwing the focus behind the sitter is that all that part of him which is nearer to the lens is violently exaggerated. If he is standing full face, or nearly so, the tip of his nose widens out, and becomes a respectable 'bottle' at the tip, his stomach swells to an ungraceful convexity, and his shoes give unmistakeable evidences of gout. If he be standing sideways, it is his hand that swells, and his fingers become elongated to the proportions of a well-grown gorilla. It is an insult to art to call this kind of manipulation artistic. The Madonna del San Sisto is supposed generally to have been the work of a fine artist, and probably is instinct with as much of the ideal as the genius of man will ever convey to canvas. But Raffaelle did not find it necessary to put the child into a white fog, or to enlarge the end of the Madonna's nose. The indistinctness of artists' outlines, which is found chiefly in the work of chalk or pencil, is simply due to the coarseness of the materials and instruments that are used. It cannot be imitated in photography by any screwing of the lens. If it could, it would much resemble the imitation by which George I. cultivated the tastes of his youth, when he ordered the English natives to be kept for a fortnight, that they might equal in pungency and flavour the oysters in which his soul had been wont to delight at Hanover.

There is one department of art into which at first sight it would seem that photography never can intrude. Its function is apparently restricted to the representation of scenes or persons that have actually existed. No one would imagine that its powers could possibly be extended to the ideal, or that it could ever serve to give form and body to the conceptions of the brain. Yet even this, the painter's special domain, has been invaded. A few photographers, of whom Mr. H. P. Robinson of Leamington is the most active worker, have made an effort to possess themselves of the pencil of the Sun, and force him to work out their own imaginations. They have tried, and to a great extent they have been able, to use the lens for the purpose of expressing pictorially their own feelings or ideas. The simplest and most limited form in which photography can be made to interpret an artist's thoughts is, of course, by selecting a subject in accordance with the idea to be illustrated, and collecting the appropriate accessories, and distributing them so as to produce the best effect. The most obvious instance of this mode of proceeding is the practice pursued by almost every portraitist of surrounding his sitters, by the help of the scene-painter, with accessories befitting their known occupations. In a more legitimate manner the same plan is adopted by most photographers who pay any attention to the æsthetic value of their compositions. But Mr. Robinson has carried the idea much further than this. In his finished picture he contrives to put together objects which are not together before the lens. Each individual object in the picture is delineated from nature by the sun; but the collocation is purely arbitrary. This result is attained by a plan of printing called double printing. It is done in this manner:—Supposing that the picture which the artist has designed in his head is to contain six figures, a cottage, and a bit of a landscape, and supposing that he cannot get any of these objects together before his camera, he solves the difficulty by taking them all separately upon eight different negatives; the figures of course being posed so as to suit the plan of his composition. Then he paints out with a black varnish every part of each negative except that which is to enter into his picture. Then he exposes his sensitive paper under each negative in succession; each of course being carefully fitted so as to leave its portions of the composition in their proper place upon the paper. When the paper has been exposed under all the eight, the print, thus, as it were, compounded, is toned and fixed like every other print.

There is no doubt that Mr. Robinson has produced some very beautiful pictures by this ingenious and laborious process; but his success has not prevented an energetic controversy both as to the legitimacy of the plan and as to its artistic value. Its legitimacy hardly seems to us to need much discussion; for it is in fact no more than what is done by almost every artist, who, when he sees any object or figure whose beauty strikes him, sketches it in his sketch-book, for future use when occasion offers. With regard to its artistic value a more qualified admission must be used. So far as the beauty of a picture, or its meaning, or its poetical power, depends upon composition—upon the selection and arrangement of inanimate objects, or the attitudes of living beings—so far there is nothing within the reach of the artist's pencil which is not equally within the reach of photography by double printing. For it would be hazardous to maintain that beautiful objects cannot be obtained as effectually by selection as by invention. Such a position would involve the doctrine that as much beauty cannot be found in actual nature as can be evolved out of an artist's brain. And the beautiful objects once found, the photographer can arrange them as freely to his own taste as the artist. But the great instrument by which the painter expresses thought and feeling, and awakens human sympathy or reverence, is not brought nearer to the photographer's grasp by these contrivances. The varying expressions of the human countenance are at the painter's disposal. Through them there is no thought or feeling to which he cannot give utterance, no chord of emotion which he cannot strike. From this, the loftiest region of the domain of art, the photographer is shut out. No industry in searching, no taste in selecting, can find for him the speaking features which a painter can create, or mould them as the painter can to express the conceptions of his own mind. Where such an attempt is made by the photographer, and is even distantly successful, the success is due not to his poetic genius, but to the dramatic power of his model.

PATENT.

A New Chemical Process for producing Photographic Pictures, and in the preparation and manner of using the materials in such Process.

The features of novelty of this invention consist:—Firstly, in a new method of preparing photographic paper, by bringing the fibrous material, of which the paper is composed, into actual contact with the compounds or simple agents used as mediums for coating such papers, thereby producing a better, smoother, and more even surface.

Secondly, in producing upon photographic paper a 'matt' or 'dead' surface instead of a smooth or glazed surface, so that when pictures are printed on such paper they will have a mellow and quiet effect.

Thirdly, in a new chemical compound for rendering photographic paper or other materials highly sensitive, and in being able to print photographic pictures on paper or other material to the actual intensity (in colour) required, doing away with the necessity of over-printing, and allowing for the reduction of intensity of colour in the bath, as is now the case.

The following are examples of the means by which these improvements in photography may be effected.

Chapter 1.—As regards the preparation of photographic paper, or the surfaces of any other material capable of receiving an impression by the action of light.

We take well-made paper, such as is expressly made for photographic use, and cover the surface of such paper with any of the well known simple mediums, such as arrowroot, or common starch, albumen, &c. &c., or with such simple mediums as described in combination with any other compound or simple material suitable for any special purpose, and instead of merely enveloping the surface with the solution and then allowing it to be naturally absorbed, which will 'fur' up the surface of the paper and merely deposit itself between the fibre (as is now the case), and when dry prevent the fibre of the paper lying down and being properly interlocked together (in fact, assuming its original surface), we, instead of the old process as above, first envelope the surface of the paper or other materials with the solutions as before described, and either place it under pressure between two polished surfaces, or subject the paper to a rubbing process by any material best suited to force the medium into and between the fibre, and lay them in a firm and compact manner, to produce when dry a smooth surface, or we pass the paper between rollers especially constructed to effect the purposes herein specified; the great and important object being to incorporate the fibre of the paper with the medium, and then to lay down and interlock the fibre again, after being fully charged, so that when dry and prepared it will have a better surface for the production of photographic pictures.

Chapter 2.—Our next novelty in photographic chemistry and manipulation is in rendering the surface of such paper or other materials highly sensitive to the action of light for the production of pictures from and through the negative to the positive. Instead of using the ordinary preparations of nitrate of silver, we prefer to use preparations of another metal in combination. We take collodion prepared by any of the well-known methods, to which may be added any of the gums or other mediums to produce elasticity, flexibility, and adhesiveness, preventing the edges from being defective, dependent on the state and humid condition of the climate. To render this collodion sensitive, we add (say) to one pound of collodion so prepared from 1½ oz. to 3 ozs. (or even more) of the nitrate of uranium, to which we add from 20 grains to 2 drachms of the nitrate of silver. When the solution is thus rendered sensitive, we prepare the paper or other material (in a properly lighted room) by pouring the sensitive solution on to the surface, and then float it in the ordinary way, the superfluous quantity being poured off the paper; it is then hung up in a dark room to dry, when it is ready for the printing-frame.

The above sensitive collodion thus prepared and combined has the following advantages over the old process: viz., that instead of having to print the positive to a greater intensity of colour to allow for its reduction in the bath, as is now the case, we print the picture from the negative on to the positive paper or other material, as previously described, up to its proper strength of colour, such as in appearance will be satisfactory to the operator, and when immersed in a bath of acetic acid, or any other agent in solution, to dissolve the salts which are unaltered by the action of light, which takes by this process about from ten to twelve minutes. We then place the picture on a sheet of glass under a stream of water and rub it with a brush or sponge, or we pass it through a series of baths until it is perfectly clean. We then pass the picture in any of the so-called toning-baths containing chlorides of any of the superior metals; or the hyposulphite bath may be used or not, as may be required by the operator to produce any tone of colour he may think best suiting his taste.

Chapter 3.—If we require a photographic picture the effect of which will be what is technically termed a 'matt' or 'dead,' and not a glazed appearance, instead of dissolving the sensitive salts in collodion as hereinbefore described, we dissolve them in alcohol and water, and add, if necessary, any of the saccharine substances. We then prepare the paper by covering it with the alcoholic and water solutions, combined with the chemical salts, to render the paper sensitive. The paper thus prepared is hung up in a dark room to dry, when it is also ready for the process of printing by the action of light.

Having now fully described and set forth the nature and object of this invention, together with the best means we are acquainted with for carrying the same into practical effect, we would remark that we do not confine ourselves to the precise quantities herein specified, as they are required to be varied in accordance with the class of negative to be printed from, or in the manner of manipulating, as long as the principles of the invention are adhered to.

What we claim as of our invention is,

Firstly, the manner of preparing photographic paper or other materials as herein set forth in Chapter 1.

Secondly, the using of the nitrates of uranium and silver in combination, by which a new salt is produced, and using them so combined with the mediums herein specified for the production of photographic pictures in their development at one operation, as fully set forth in Chapters 2 and 3 of this specification.

Photographic Improvements.

A NEW discovery is reported to have been made by Herr Wothly, a German photographer, by means of which it is asserted that photographic impressions, hitherto more or less subject to change and decay, will be rendered permanent and imperishable. The process by which this improvement upon the present method of preparing photographic paper is said to be secured consists in the substitution of a double salt of uranium for nitrate of silver and of collodion for albumen, which have hitherto been used in the preparation of photographic paper. The ordinary method of preparing sensitive paper is to size it with albumen, the surface of which is then submitted to the silver preparation, which is sensitive to light and fitted to retain the printed image. But this process has been long felt to be defective; the impression obtained under these conditions is not only less perfect than the reversed image upon the glass, known as the "negative," from which it is printed, but the production of any number of impressions of unvarying excellence is well-nigh impossible. We know also that all these impressions are liable to change, and in many cases to disappear. There can be little doubt that the film of collodion—which, under Wothly's process, is rendered sensitive, not by nitrate of silver, but by being combined with the salt of uranium—would yield a far better surface to the action of the light; and the impressions fixed upon it would be free from all those blots and inequalities which mark more or less all photographic impressions hitherto produced. This alone is a great gain. The other advantages claimed by the inventor—of absolute permanence and simple and easy manipulation—are not so clearly established; but there seems great reason to think that an important step in advance has been made. Time alone can be accepted as the true test of all claims for permanence; but the impressions obtained by the new process are said to have been exposed to the action of sun and rain for weeks together without betraying any sign of change. A condition of absolute permanence is scarcely conceivable, and, in the case of photographic pictures, hardly desirable. A visit to a photographic exhibition raises no wish to secure its contents for an admiring posterity. Here and there we might wish to preserve from decay the semblance of a great man; but our descendants might think the bequest greatly encumbered if it were accompanied by a crowd of the Browns, Joneses, and Robinsons of our generation. Photography is levelling and undiscriminating. Brown and Jones make as good or better photographs than men of the stamp of Newton and Napoleon. We do not recognize men by the light of their photographs, though we usually recognize photographs when we have become familiar with the countenances they represent. A great portrait, directed by a human brain and executed by a human hand, is worth all the photographs ever produced by the sun. On canvas or in marble let us preserve the resemblances of our great men for the benefit of our children, and take little heed about the permanence of photography as far as they are concerned. Again, in the production of photographic impressions of landscape, absolute permanence is not greatly to be desired. The real beauty and important truths of nature are never represented, and no photographic picture conveys the impression which is made upon the mind by a sunlit landscape. There is nothing valuable about it but correct perspective; even natural forms are distorted by a false light and shadow, and require that truthful interpretation by an accomplished artist, of which we have an instance in the background of Mr. Herbert's fresco, to set those before us in their real and true proportions. In its application to architectural forms photography is more successful; but even here it merely records one of many truths. Take up, for example, a photograph of the Coliseum. We shall find, indeed, an accurate representation of the surface of the stones; but, of its immensity and beauty, not a notion will be conveyed to one who, not having seen the building itself, is unable, as it were, to bring to the aid of the black and white map before him the complete impression fixed upon his memory. The slightest sketch by an able painter will be infinitely more true, though, in all probability, when compared with the photograph, it will be found very inaccurate. The power of representing surfaces with marvellous verisimilitude is exemplified by the results that have been obtained by exposing to the lens the snow-surfaces of the Alps; but the effect of light and shade in the photographs of Alpine scenery is so entirely false that they excite no feeling in us save the passing excitement of our curiosity. We have certainly no reason to desire that they shall become absolutely permanent. There are, however, cases in which we might desire that photographic impressions should endure. The ever-changing appearance of the cities we inhabit would be well recorded by photography if we could trust to it. The fading records we already possess of the great batteries before Sebastopol, and of the works before Delhi and Lucknow, would be very valuable illustrations of most interesting periods in the life of the nation. The permanence of photographic records in these and similar cases may be very desirable; but, looking to the actual state of photography, it is not in the direction of permanence that we desire to see the greatest improvements. The first thing to be desired is the discovery of some process which shall no longer falsify the relations of colour. Such a discovery may, perhaps, and at present seems to be highly improbable; but, as long as yellow hair is represented to be black, and blue eyes white—as long as there is no relation at all preserved between the distances of a landscape—it is useless to talk of the truth-rendering art, and waste of time to labour in the direction of rendering its impressions permanent; infinitely more gratitude would be due to him who should discover a means of arresting the decay of "The Last Supper," or "The Peter Martyr." When we know that these and others, the greatest works the world ever saw, are gradually fading and passing away, we almost feel insulted by a discovery which threatens to preserve for ever photographic impressions that may be thrown off by any one possessed of leisure and a hobby at the rate of a thousand a week.

As a discovery of incalculable importance to the interests of art, and as certain eventually to become its most valuable handmaid, we hardly sufficiently estimate its importance; but, if we look frankly at, and compare without prejudice, the photographs now produced with those produced twenty years since, we shall find that the faults of that time are the faults of this, and that, except in the matter of smoother surfaces, which to a painter is a questionable improvement, no advance has really been made. The practice of the art has increased until it has become a very lucrative trade, and the skill of the workmen has naturally increased likewise; but it is true to the same extent and false to the same extent now as it was then, and we have no greater reason now than we had then to desire or to welcome the discovery that may render its products permanent.—*Reader*.

MEMORANDA

(Photographic, Scientific, and Practical).

Physiological Effects of Cyanide of Potassium.—M. August Busch, writing in the 'Photographic News,' describes the action of cyanide of potassium upon the system as follows:—

If cyanic acid be inhaled pure, unmixed with air, instantaneous death is the consequence.

In the chemical laboratories where prussic acid is manufactured, the assistant who conducts the process must take the greatest care in breathing; if he inhale a little too much of the escaping gas, he feels his eyesight suddenly leave him, and he is in complete darkness; then he has to retreat quickly, or he will fall on the floor.

Electroplaters and gilders, who have to work constantly over strong solutions of cyanide of potassium, feel, after a time, if their working-room be not well ventilated, many very bad effects from the poisonous exhalation. Listlessness, weariness in the limbs, dimness of sight, deafness, and loss of memory are some of the effects produced; painful, obstinate ulcers break out on different parts of the body, especially on the hands, when these have been immersed in the fluid.

Strong cyanide of potassium, when applied to an open blood-vessel, is deadly; applied to a broken skin, it produces great pain, and generally a bad ulcer; and if applied to a whole skin for any length of time, it must have the same consequences, especially if that skin be already decomposed by nitrate of silver; for it must be remembered that the elements of cyanide of potassium are so ready to part with each other, that not only the cyanic acid acts as if it were free, but the potash acts like free caustic potash, viz. dissolves skin, fat, &c., and leaves the deadly poison at liberty to act upon the blood-vessels underneath.

It is, therefore, proper to advise photographers again and again—

1st. To keep their sulphuric, nitric, and muriatic acid bottles far enough from the cyanide of potassium.

2nd. To have their dark rooms always ventilated as perfectly as possible.

3rd. To rather show the stains of honest work, than allow themselves to be rendered unfit for work by employing so dangerous a detergent; but if they *will* apply cyanide to clean their hands, never to do so where the skin is broken, nor, if the skin is whole, to continue the operation long, and always to rinse well with water afterwards.

The fact that most of the commercial cyanide is largely adulterated with carbonate of potash does not lessen at all the danger of employing the article; it merely compels the photographer to buy three pounds of cyanide of potassium to do the same amount of work for him that one pound ought to do.

Spontaneous Decomposition of Pyroxyline.—M. de Lucca has recently been making some researches into the decomposition of pyroxyline, with the causes and results, which are recorded in the 'Comptes Rendus.' He says:—

In the first place, the condition of keeping the gun-cotton sheltered from the light does not always furnish good results, particularly when the vessel which contains it is badly corked and is surrounded with a moist atmosphere. Once the reaction has commenced with a slow disengagement of nitrous gas, it is not possible to stop it. This decomposition is greatly facilitated by the action of light, and still more by that of the direct rays of the sun or of artificial heat. A sample of gun-cotton was, after a commencement of spontaneous decomposition in the dark, divided into four portions, one of which was left in the dark, another was placed in the diffused light of a chemical laboratory, the third was exposed to the direct action of the sun's rays, and the fourth to the action of heat supplied by a *bain-Marie* marking 125° Fahr. It was observed that, while direct heat produced a vivid reaction upon the gun-cotton, direct light acted with less energy, that diffused light exercised a very slow action, and that in the dark the gun-cotton was decomposed with extreme slowness. The spontaneous decomposition produced four very distinct phases. The gun-cotton, during the first phase of decomposition, slowly contracts without losing its primitive form, so as to occupy one-tenth of its original bulk. It remains in this state several days, and then it begins to dissolve, and is converted into a sort of gummy substance which strongly adheres to the fingers, and has lost its cottony texture; the bulk of it is also diminished one-half: this state constitutes the second phase of spontaneous decomposition of gun-cotton. The third phase commences after a shorter or longer time, according to the temperature of the atmosphere: the phenomenon it produces is not a contraction, but a dilatation; so that the cotton which has lost during the second phase nine-tenths of its primitive bulk swells so much in the third phase that it occupies the entire capacity of the vessel which contained it before its decomposition; that is to say, it has become twenty times as bulky after its last contraction: in this state the gummy aspect continues to manifest itself; but the mass is porous and full of cavities, like a sponge. During these three phases there is disengagement of nitrous fumes, which are abundant during the third phase; still this gaseous disengagement diminishes in a sensible and progressive manner, and we then perceive that the matter loses its gummy aspect and yellow colour, becomes brittle—so much so that it can be reduced to powder between the fingers—and assumes a white colour, like sugar. This state constitutes the fourth phase of cotton which decomposes spontaneously. The time necessary for the accomplishment of these four phases varies according to the temperature of the atmosphere, but at least five months are required for their accomplishment.

Thus gun-cotton, by the slow action of its own elements, and at the ordinary temperature, loses all its primitive properties, disengaging gaseous substances in which we recognize the presence of nitrous compounds and some traces of formic and acetic acid, and leaving for a last residue an amorphous porous matter, comparable in appearance to sugar, very acid, and almost wholly soluble in water, and containing abundance of glucose, which can be easily isolated, gummy matters, oxalic acid, a small quantity of formic acid, and an acid which I believe to be a new one, from which I have obtained a salt of lead, and which I shall examine hereafter.

The glucose resulting from the decomposition of pyroxyline has the taste and aroma of honey; it reduces tartrate of copper and potassa with great facility; and it ferments in contact with beer-yeast, with the production of carbonic acid and alcohol. The quantity of glucose obtained from 100 grammes of gun-cotton spontaneously decomposed was about 14 grammes.

Gun-cotton of good quality, exposed to the direct action of the light of the sun, soon exhibits signs of decomposition, at first by the odour of nitrous compounds, and afterwards by the yellowish colour of the vapours disengaged. All the specimens of pyroxyline that I experimented upon have become decomposed, in a shorter or longer time, under the influence of the direct rays of the sun. Sometimes the change in the gun-cotton begins during the first day of the experiment; at other times the decomposition manifests itself after many days' exposure to solar light. In these experiments the thermometer stood at about 86° F., and the temperature seldom rose higher.

Artificial heat acts more energetically than solar light, but always at a temperature more elevated than that produced by the direct rays of the sun. A sample of gun-cotton was divided into two equal parts, one of which was exposed to the direct action of solar light, and the other in an oven to a temperature of 95° to 100° F.: the pyroxyline exposed to light decomposed first, the other portion was not altered by the action of 36 hours' artificial heat. There is then a peculiar action in the light of the sun which provokes the decomposition of pyroxyline.

When the gun-cotton is compressed, it is decomposed more readily, both by the action of solar light and by the application of artificial heat. In the month of December 1861, I introduced some pyroxyline into a test-tube, and compressed it with a glass rod; I then made a vacuum, and closed the tube hermetically at the spirit-lamp. The gun-cotton thus enclosed has been kept to the present time without showing any signs of decomposition; while similar samples, introduced into cork or ground-glass stoppered bottles, or simply covered with paper, have all changed in a few months, that is to say, during the year 1862. It will then be important to verify these facts upon a large scale, and see if they will afford a ready application to the conservation of gun-cotton for the wants of industry.

MISCELLANEA.

Her Majesty has expressed great interest in the new printing-process known as the "Wothlytype;" and a portfolio of choice specimens has been, by command, forwarded to Balmoral for her inspection.

Grotesque Photography.—Humphrey's Journal says:—At the door of Mr. Holmes, photographer, Broadway, a very interesting portrait of Father Abraham is exhibited. This portrait consists of a striking outline of the President, studded all along with minute portraits in juxtaposition. All the distinguished characters in America, such as generals, politicians, divines, poets, ladies of the buskin and of charity—these, beheld at a distance, confer on the President's physiognomy the appearance of the ravages of small-pox. Jefferson Davis has his position in the President's eye; General McClellan's on his nose; near his ear are seen his ministers. Barnum occupies a commanding position—his forehead; while Messrs. Bennett and Beecher are his aids on either side. Miss Cushman sits upon his lips, a little negro on his breast, and Fremont on his heart. Amongst the numerous smiling damsels that adorn this photographic gem may be distinguished Belle Boyd and Mlle. Vistoale. The likenesses are all striking, and the composition, as a whole, is a felicitous performance.

Lord Brougham a Photographer.—A morning paper says:—Lord Brougham, who has just entered upon his 87th year, and is in excellent health, is entertaining a circle of friends at Brougham Hall, Penrith. His lordship is, among other things, an amateur in the interesting art of photography. Mr. Mayall, the eminent photographer, and his son, Mr. J. Mayall, jun., are included among the guests.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

J. L. L., Mayfield.—A little apparatus for burning the magnesium wire was exhibited by Mr. Hart to the Photographic Society at a late Meeting. We believe Mr. Soloman, of Red Lion Square, will supply you with all that is needful for taking pictures by means of the magnesium light.

Amateur, Beeralston.—The Association of Photography have determined to make no charge for a licence to amateurs to practice the Wothlytype process. They supply the needful chemicals, but of course they may be elsewhere procured. Write to Mr. W. M. Brown, the Secretary, 213 Regent Street, enclosing 30 stamps, for a specimen picture, which you will forthwith receive.

L. L.—The Uranium Processes, published by M. Nièpce, are by development either with nitrate of silver or with silver in conjunction with bichloride of mercury, a subsequent toning by gold rendering such prints difficult to detect from ordinary silver ones. Prints of various colours are produced by uranium. To make one of a fine red, float the paper in the dark on the following solution:—

Nitrate of uranium	1 drachm,
Distilled water	5 drachms,

dry and expose under negative for about the same time that a silver print would take. Wash well in water, and immerse it in a solution of the red prussiate of potash, of the strength of 1 grain of the salt to every 50 of water; wash again and dry. This red print is converted into one of a brilliant green by immersing it in a weak solution of nitrate of cobalt for one minute, drying before the fire, and fixing with a solution of sulphate of iron with an excess of sulphuric acid; well wash the print, and dry. If a prepared sheet of uranium paper is exposed, and then washed with warm water and at once plunged into a weak solution of chloride of gold, half a grain to 100 of water, a violet picture is the result.

Blue pictures are obtained by preparing the paper with the red prussiate of potash, drying, and, after exposure, passing it through a cold saturated solution of bichloride of mercury, again washing, and plunging the picture into a cold saturated solution of oxalic acid, washing well, and drying.

Many other variations of monochrome prints may be produced by the use of various salts.

We have been favoured, by Mr. Melhuish, with copies of the very beautiful photographs for which prizes have been awarded by the Amateur Photographic Association, and which we shall notice more fully in our next.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 152. DECEMBER 15, 1864.

PHOTOGRAPHIC SOCIETY.

The next Meeting of the Session will take place at King's College, on Tuesday, January 3rd, at eight o'clock, when Mr. Henry Cooper, Jun., will read a paper in continuation, "On Printing with the Salts of Uranium." Members are invited to discuss the subject and favour the Society with their experience thereon.

Members may now obtain the photograph of "Bringing Home the May," on application to Mr. Mattress, at Messrs. Taylor & Francis's, Red Lion Court, Fleet Street.

Meetings of the Society, 1865.

1865. Tuesday,	Jan.	3
"	Feb. (*Anniversary*)	7
"	March	7
"	April	4
"	May	2
"	June	6

Several important matters, intimately concerning the prosperity and position of the Photographic Society of London, have recently been made subjects of serious consideration by the Council. The high position of the gentlemen entrusted with the management of the affairs of the Society affording them special opportunities for collecting the individual views of many Members, each one may be considered to bring to the Council Board a representative opinion.

The London Society itself represents the science and art of photography in England. It first taught and led the way; it still holds its strength after the way is cleared, and the work of the pioneers is done. We need not refer to the numerous societies which have risen into existence and died out in obscurity since our Society began its career, except as affording evidence of the eager love of their art among photographers, and their appreciation of the advantages accruing from intercommunication of individual views, of experimental researches, and of attained knowledge.

The Journal of our Society was established in order that all the Members, absent or distant, might equally possess exact and reliable information as to its proceedings and the progress of photography. As the papers read at the Meetings were previously approved by the Council, on the Council fell the responsibility of assuring to each author an exact rendering of his views, so that every reader of the Journal might peruse the paper exactly as it came from the author, without abbreviation or alteration, and might have, under authority, an account of the ensuing discussion, to weigh and think over the opinions expressed. Thus the archives of the Society have been stored in its Journal, and the imprimatur of the Council has stamped their authenticity. This assurance of accurate rendering has been but a due acknowledgment to authors and speakers of their kindly efforts to advance the science and art of photography—a courteous recognition that all they wrote and said had value and weight. But, beyond the true rendering of the proceedings of the Society, it is obvious that the Journal involves a high responsibility far beyond that of mere money profit; having to supply trustworthy references to those who may hereafter require to consult the annals of photographic progress. Therefore it has little to do with the "enormous gooseberries" of photographic literature, or with any of those sensation-subjects which interest to-day and are forgotten to-morrow. It is needless to particularize these. There is scarcely a photographer who has not tried a large number of highly recommended but useless processes, to the great waste of time which might have been far more profitably employed. And many are the amateurs who have wasted their substance, and disgusted their sitters (to the evident detriment of legitimate photographers), by pursuing easy processes according to solemnly commended rules of thumb, believing that photography, the true and worthy art, might be taught in a few pages, and practised with success by folks knowing little of art, less of chemistry, and nothing of optics.

To the real scientific amateurs, however, photography is largely indebted for many most important discoveries. They have had previous education in science, and have the leisure without craving thoughts of any "res angusta domi." Therefore when the results of their work are given to the world through the Photographic Society, with the guarantee of their good names, and when by the decision of practical judges they are held worthy of being submitted to the Meetings, it is obvious that there devolves upon the judges—the deliberative Council of the Society—a responsibility that such communications shall go to the readers, here and hereafter, as the authors wrote them down. And this responsibility is even greater as regards the communications of the practical photographer—to whom great immediate injury may result from any curtailment of what he has written, or from any inefficient representation of words he may have used in the course of discussion.

We purpose, under sanction of the Council, to indicate from month to month the reasons for various important changes which it is now proposed to gradually effect, in order to establish the prosperity of the Photographic Society, and insure a maintenance of that high position it has hitherto held throughout Europe. We have, in the foregoing remarks, gently and tenderly touched many subjects which have been very thoroughly probed and investigated by the Council. The following Resolution has been decided on; and we believe that the unanimous opinion of the Council will be echoed by all who have at heart the welfare of the Photographic Society and the dignity of the science, and who rightly consider the obligations due to those who supply papers at the Meetings, who take part in the discussions, and who desire that what they add to the stock of knowledge shall be authoritatively reported.

The Resolution of the Council was to the following effect:—

> "That papers or communications presented to, or read at, the Meetings of the London Photographic Society, shall be exclusively the property of the Society until after publication in the Journal of the Society."

It is right we should mention that steps are now being taken to insure to the Members an early issue of the reports of Meetings. In the next Number we shall refer to this subject.

DUBLIN INTERNATIONAL EXHIBITION.

Members and other photographers who are intending to send contributions to Dublin should make application for space without delay. Their applications may be addressed either to Sir J. J. Coghill, Bart. (under whose superintendence the Photographic Department is placed), Glen Barrahane Castle, Townsend, Skibbereen, or C. E. Bagot, Esq., 112 Grafton Street, Dublin. We believe that all available space will be allotted by the close of the present month. Mr. Le Neve Foster, Society of Arts, Adelphi, the Honorary Secretary of the London Committee of Advice, will also furnish every information required in aid of the Exhibition.

Notice.

Photographers and others are hereby informed that the 31st General Rule in the Prospectus of the Dublin International Exhibition, which states that

"*Medals and Certificates of Merit will be awarded in all Sections* EXCEPT IN THAT OF F. (FINE ARTS),"

is altered with respect to the Photographic Department, in which Medals and Certificates of Merit will be awarded.

(Signed) J. J. Coghill,
Hon. Director, Photographic Department.

LONDON PHOTOGRAPHIC SOCIETY.

Ordinary General Meeting.

King's College, London.

Tuesday, December 6, 1864.

J. Glaisher, Esq., F.R.S., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The Chairman said that the paper he was about to read had been sent in compliance with a request he had made at the previous Meeting, when the beautiful slides of microscopic photographs, by Dr. Maddox, were exhibited by Mr. How. He then proceeded to read the following paper:—

On Photomicrography. By Dr. Maddox.

In compliance with the request to furnish a few remarks on the photomicrographs exhibited at the last Meeting of the Photographic Society, some of which are to be shown on the screen by Mr. How, of Foster-lane, at the next Meeting, I will, to the best of my ability, endeavour to do so, although confident there is little I can add to the common stock of knowledge on this most interesting, and, I may say, difficult branch of photography, that may not, I fear, tend rather to hamper any remarks your worthy President may be pleased to offer, than afford him assistance. Therefore you must regard them as a verbal apology for all defects in my own part of the work, and an encouragement for others to labour in the same field.

I will not venture on the historical portion more than to say we are largely indebted to those who, many years since, employed the microscope or some special optical arrangement to procure photographic enlargements of microscopic objects, when Kingsley, Reade, Delves, Busk, Shadbolt, Wenham, Dancer, with many others in this country and abroad, were the contributors, and Highley, Hooker, and others the chief exhibitors on the screen. Without in any way detracting from their most valuable efforts to lift this art to some acknowledged rank in science, I fear we shall find their appeals did not obtain, from either microscopists or photographers generally, the favour their talent and energy in clearing away obstacles, coupled with the beauty of their achievements, might have been expected to command. Where was the fault? Surely there must have been something serious against this branch; for we can note how feebly it has kept pace with the vast progress of photography in all other kind of illustration. Loud was the cry against it in some quarters; hopeless the efforts of individuals to obtain satisfactory recompense, either complimentary or pecuniary; yet, in working at the subject, I felt confident the day must come when its feeble voice would be recognized, and its assistance sought for a far more correct interpretation of some of the minutiæ of minute objects than the most intelligent draughtsman could afford time to indicate in his beautiful delineations; and in this conviction I have worked hard, battling with obstacles, here and there encouraged by the kind remarks of some of those in whose steps I have been glad to tread. Why this neglect? Why this want of general encouragement? Partly it may have been caused by photography carrying a high hand in more lucrative, less troublesome, and more ready departments; partly by the necessity to be acquainted with a second branch of science—microscopy; partly by the fact, which we none can gainsay, that in a properly corrected object-glass for objects which, when set up or well well prepared, have their various parts lying in different planes, it is impossible for each to be optically in focus at the same moment, and it is difficult to arrive at the whole features of such an object by a single photograph, the microscopist of course varying the focus of his object-glass to suit these different planes, whilst the photographer must remain content with choosing the best general view, or take several negatives, subject, of course, to some confusion in detail; partly by the necessity of much patience—a virtue drawn on largely by all photographers, but in this branch worked out to its finest threads. Still it exists, and now some of the works in microscopical literature (I allude more particularly to Dr. Beale's new edition of 'How to Work with the Microscope') have called especial attention to its utility and application. Let us therefore hope the day may not be distant when our present thin ranks may be swelled by those who have mastered the photographic side, and are willing to conquer the microscopic portion. If no special apparatus be employed, the usual method is to turn the microscope horizontally, take out the eyepiece, centre the tube with the centre of the camera, fixed on a table or proper base-board, the stage of the former being placed correctly in a plane parallel with the greyed glass of the camera (I prefer these fixed on a base-board, supported on a widespread double triangular stand, for facility in use); remove the camera-lenses from their fittings, place a blackened card cap on the brass shade, having a circular central aperture of a size for the body of the tube of the microscope to work through; insert the tube in this, then tie loosely a velvet collar on the body, to slide against the card cap, and close all against extraneous light at that junction. Having previously learned the best general appearance of the objects under the microscope with the object-glass intended to be used, place the object (say it is on the usual 3 × 1 inch slide) on the stage of the microscope, close up the camera, turn the mirror towards the sunlight, and throw a full volume of rays through the object and into the body of the camera, *being sure there is no false light* or reflected light from the microscope-tube, object-glass fittings, or sides of the camera; now rack the object-glass backward and forward until a well-defined image is seen on the focusing-frame, and then determine the size the object is to be depicted; drawing out the camera to the required distance, re-focus, and by means of the fine adjustment obtain the most perfect visual focus you can, using some form of focusing-glass. Ascertain, by taking a negative, whether the object-glass in use has its actinic focus beyond the visual, which is usually the case, though in the higher powers this difference is very trifling. Moreover at the present time I find some of the lower powers are made nearly correct for both actinic and visual foci, or rather under than over corrected; if the former, the object-glass must be brought a little nearer to, if the latter, a little further from the object: note the amount of difference required, by the parts of a turn of the fine-adjustment screw.

When the object-glass is furnished with an adjustment of its own, to meet the error introduced by the thin glass cover over the object, I find it best to set this adjustment in the microscope, using the lowest eyepiece. Suppose the object selected, the illumination arranged, the proper focus settled, place the usual bromo-iodized prepared plate in the plate-holder: remark that the illumination on the greyed glass is equal; if not, turn the mirror until it is; now place, between it and the stage of the microscope, leaning against the latter, a blackened card, withdraw the screen, insert the plate-holder frame, cover all the body of the camera with the covering-cloth, lift the shutter; wait a moment *until the vibrations of the instrument cease*; snatch away the card, and replace it according to the time of exposure needed, which may vary from half to fifteen or more seconds. The plate is developed in the usual way, with the iron developer, cleared by cyanide solution, and intensified by any of the ordinary methods. This must be carried as far as it can well be, without blocking out the finest lines in the negative by the newly deposited substance on the edge of the faint lines or striæ, these being, when dry, drawn together, often obliterating such as appeared all correct in the wet negative. Here there is some difficulty, and I have not yet found a satisfactory plan for all cases; indeed, when the negative is to be employed to furnish a transparent positive for the screen, it is often necessary to paint out the field in the negative (a task very troublesome), or have the half-tones and finest shadows marred by the contrast. It is yet a desideratum to find some wash, without the use of hydrosulphate of ammonia, that would render the field impermeable to actinic light, without a surface deposit. I usually employ wet plates, for this reason: they are sooner developed should a second negative be required for rapid printing, &c., or for stereoscopic purposes, thus learning whether the focus has been correct, and how much it may require in alteration to give combination and solidity in the latter; to which in my own method is also added a slight side-movement of the object. Dry plates can, of course, be used. It is usual to employ some form of achromatic condenser (although a simple Coddington lens long satisfied me) between the mirror and object, and some screens of blackened card-board with a circular or other shaped aperture between the front of the camera and greyed glass. I always place one near to the latter. For full detail on all these points, I must refer to the writings of others, and my own, recorded in the back numbers of the 'British Journal of Photography,' also in the 'Quarterly Journal of Microscopical Science,' and to an able article in the July Number of the 'British and Foreign Quarterly Medico-Chirurgical Review,' on the Employment of Artificial Illumination, of which I cannot speak too highly, or of the masterly productions obtained by its means, and to Dr. Beale's book, where every information I could offer will be found on these matters.

Many objects, from their form or colour, present determined obstacles; therefore we do not attempt them. A large class of most beautiful structures are the Diatomaceæ, which consist of microscopic forms in all the varied costume of variety, encased in a siliceous structure, and highly variegated with either superficial or more deeply penetrating markings, which have formed points for many a discussion amongst microscopists, and yet remain a vexed question, but which, doubtless, will one day be more nearly settled by photographic aid, using parallel light and stereoscopic pictures, than by any means hitherto employed.

Objects.—These bodies afford a field in itself rich and scarcely trodden. The *Actinosphænia splendens* has most of its parts nearly in one plane; hence with the $\frac{1}{12}$th objective, and about one second's exposure, I was enabled to have it fairly depicted. Its natural size is about that of the dot over the letter "i" in the ordinary newspaper-print. Its surface is beautifully figured, and now to the "eye tells the romance is true." It combines nicely in the stereoscope.

The *Coscinodiscus*, from the infusorial earth of Barbadoes, furnishes another kind of siliceous valve, of a saucer-shape. This, although in parts beautifully defined, is not equally perfect over its whole surface; the object, most likely, was a little slanting on the slide, to which, during many trials and most careful centring of the illumination, the act of waiting out the vibrations, and not using any form of heliostat, may have partly contributed. Nevertheless with its fellow it combines beautifully in the stereoscope with great relief. It is not larger than the other diatom. It was taken with the $\frac{1}{12}$th objective, and an exposure of about three seconds. Of the *Heliopelta*, an object of the same class and nearly like size, in consequence of the conical undulating rays which alternate with each other, the extreme closeness on the valve of the surface-markings, and the difficulty *to obtain a very thin valve* so as to bring the whole equally into one focus, a best general view had to be substituted. There the opprobrium rests more strongly than in most cases. We must admit it. It was taken with the $\frac{1}{8}$th and short exposure. *Licmophora*, a beautiful object growing as an incrustation on sea-weeds, consists of a series of cuneate siliceous valves or frustules, adherent and opened out into a most charming fan-shape, the narrow part attached to a long flexible stalk or handle. These objects thus in union are somewhat larger, and were taken with a medium power (as $\frac{4}{10}$ths), and about six seconds' exposure.

The *Navicula didyma*, another of the many forms of diatoms, is rather a difficult object to photograph. It possesses a certain thickness which interferes with the passage of the light, and gives rise, unless under the most careful illumination, to interference from the upper and under surface-markings. This was taken with the $\frac{1}{8}$th, and on the negative magnified about 600 times; it combines very fairly with its duplicate image. Exposure three or four seconds. The negative of the section of the *Echinus*-spine is simply an image of the transverse thin section of one of the spines of a Sea-urchin. The reticulations in the calcareous columns of the spine are very difficult to preserve clear, and bear largely on the former remarks of fine markings closed up with the secondary deposit on the image. The size, about a small split pea, admits of using a low power, as the $\frac{2}{3}$rds or 1 inch.

The spicules and plates of *Synapta* are prepared from the integument of a vermiform Echinoderm, the anchors in the natural state being hinged to the narrow part of the basal plates. They are calcareous, and of a size needing only the 1 inch or $\frac{2}{3}$rds, and a very short exposure.

The *Cyclops*, one of the Entomostraca, will afford an apt illustration of the utility of photomicrography. The agile little creature was simply removed from the water, washed on a slide with a camel's-hair pencil, drained, covered with a little glycerine and gum mounting fluid, then with a thin glass cover, and at once photographed. The numerous bristle-like appendages (branchial feet) on the death of the creature are usually drawn together; and they, like other translucent fine rods in a bundle, refract light highly, and furnish a difficulty to definition. It is about the $\frac{1}{15}$ of an inch in length: a $1\frac{1}{2}$-inch objective answers here, and a short exposure.

The parasite of the Beetle has been treated in a very similar manner. If not too brown in colour, it will usually yield a very fair negative; but the exposure must be increased to about 10 seconds, with a one-inch object-glass.

The *Acarus* of the Chaffinch is very minute, and needs a $\frac{4}{10}$ths or $\frac{1}{8}$th objective to display its structure, as the curious pads on the feet and striated integment; exposure about 10 seconds. The pads are almost sure to be obliterated in the intensification.

The Field-mouse parasite is another example of the method of treating these objects and photographing them at once; but, from the object being somewhat thicker and more coloured, it is difficult to obtain equal definition throughout the thoracic, without overdoing the abdominal portion: a $\frac{4}{10}$ths or $\frac{2}{3}$rds answers.

The parasite of the Mole furnishes another object of considerable thickness in the body and padded claws. I found it very difficult to obtain a fair negative on this account: it required a longer exposure than the former.

The male parasite of the Sparrow, an *Acarus* affording a curious illustration of the growth of the hinder extremities into most powerful claws, by which it can retain its mate in its grasp, and obtain a strong hold on the feathers of the bird. This is a difficult object to photograph, by reason of the numerous long hairs, which generally are out of focus, and thus thickened. The female affords better definition, the body being less dense; indeed an ovum is discernible in the abdominal cavity. These objects are minute, and require a $\frac{4}{10}$ths or $\frac{1}{8}$th to display their structure, and an exposure from 6 to 8 or more seconds.

The Itch-insect needs no special remark. In the stereoscope its duplicate image combines well.

The female flea of the Mole furnishes us with an example of a most difficult class of objects; from their colour, almost non-actinic. Indeed their intimate structure is only brought out under 15 or 17 seconds' exposure to light concentrated from an achromatic prism, which I prefer to the concave mirror, and a large achromatic condenser, usually known as Sollitt's condenser by microscopists. This long exposure requires a slow collodion, and one that will bear considerable and most careful intensifying, or all trace of the buccal apparatus of lancets will be surely lost. The thickness of the body and legs being so different, the latter are scarcely in focus, which was taken for the hairs on the upper part of the fore legs. One-inch objective. I had no end of failures in this object and its fellows, spoiling the negatives, chiefly from the great difficulty to hit the exact period of exposure with this concentrated sunlight. The same remarks apply to the male flea of the Pigeon.

The cornea of the Beetle has a somewhat puckered appearance in some of the hexagonal facets, from the contracted membranes. I found it a very difficult object, from great refraction at the edges of the facets. It requires only a short exposure.

The foot of a Fly. In this object were many drawbacks. The pad is almost translucent, and the tarsus much coloured; still the negative shows what can be done: even in one of the pulvilli, a portion of the membrane torn away in mounting is seen. Both the fine and stout hairs have preserved their contours without any *bordering*—generally a most tiresome cause of failure, from such edges strongly refracting the light. I need scarcely say, it was only by perseverance these difficulties were overcome. A $\frac{2}{3}$rds objective and full exposure required.

The gizzard of the Cricket demands no particular comment, nor does the Sycamore-leaf insect, save to remark that this latter furnished me with the object on which I tried the magnesium light with very fair success, though not perfect definition; still, under a proper method for burning the wire, and rendering the diffused rays parallel or concentrated to a focus, there is every chance of its great utility. The correction of the object-glass may be different to that of sunlight, which must be attended to. The object is about the size of a small pin's head. A $\frac{2}{3}$rds objective suits very well.

The scale of the Hawk Moth I do not regard as a great success. The object is mounted (as microscopists say) "dry;" and, having to use a thin covering of glass to prevent its dropping off from heating by the passage of the rays, there seems to be more difficulty than with objects mounted in some medium. Possibly artificial illumination would well answer for this class of objects. In the variety of the scales there is a large choice: they usually require only a short exposure, with $\frac{1}{5}$th objective.

The spiracle of the Cockchafer is again an example of the utility of photomicrography applied to the finer parts of natural history. This also well exhibits the necessity for absolute freedom from vibrations in the instrument at the moment of taking the image, likewise of the danger in after-intensifying of filling up the marks or finest lines. A $\frac{2}{3}$rds objective, with about six seconds' exposure, is needed.

The tongue of a Drone Fly. Here we have a transparent membranous bag beset with short hairs, stretched at the top on a series of nearly semi-round tubes edged with teeth, and a dark-coloured basal support of dense chitine. I would in this negative call special attention to what can be discerned as the sad leprous spot that, alas! mars so many otherwise good negatives—bad as the Aleppo spot on many an Eastern beauty. You must treat it most kindly. It is called, *par excellence*, "the sun-spot;" that is, one part of the field is more highly illuminated than the rest. It may be at any part of the field, though generally, when the collimation of the instrument is perfect, it is central. It may be greatly reduced by withdrawing the focus of the achromatic condenser from the object, and the mirror from the former; in other words, decreasing the concentrated light. I have made a great many trials to get rid of this, but, in some object-glasses of large angular aperture, without more than partial success. It happens with all kinds of condensers, from the Coddington upwards; it does not disappear, in some positions of the apparatus, even when the condenser and mirror are considerably out of their proper range; but it becomes, as in this case, less offensive—indeed barely visible.

I will now conclude these remarks by reference to an object exhibited in Mr. How's series as a print:—

The graceful *Pleurosigma formosum*. This siliceous valve, with its curvatures in length and width, has given me more trouble than anything I have attempted, endeavouring to procure the valve entire, and exhibit the striation from end to end. Upwards of forty different negatives have been taken of this object, not always from the same valve; and each negative had a character of its own, decidedly distinct from its fellows when magnified—most of them perfect in parts, as regards the focus, but many either slightly overdone or over-developed. It is an object that will largely try patience and skill; indeed, without both, although success may happen, it cannot be reckoned on. The same valve I have taken enlarged to about 19 inches, but in three negatives; also with $\frac{1}{12}$th to about 11 inches. The object does not lie in one plane from end to end. I have had a small "gimbal" stage made by Mr. Highley, from my drawings, to meet this difficulty: a small tangent conical screw at each corner acts on the top or object-plate, which is kept in its place by springs beneath. It appears to answer its purpose. The field is far too vast to draw any bounds: no doubt the present method is the most likely to call attention to this subject, and open up treasures of hidden charms where the minute vie with each other. The advantage possessed by those who have good negatives may be utilized, as in transparencies for a stereoscope, also for prints on opal glass, and, I believe, might be brought into use for decorative purposes, especially as applied to windows instead of stained or grained glass, the forms of the Diatomaceæ being admirable for this purpose. In conclusion, I must not allow to pass unnoticed the compliment paid by Mr. Glaisher at your last Meeting, without expressing my thanks to him; and let me assure those who may be tempted to join our ranks that they will find in the lowest forms of life an

> "Ostentation of creative power,
> For minds of the first magnitude to launch
> In endless speculation, and adore."

Mr. How then exhibited, on a disk of about 7 feet diameter, by means of the oxyhydrogen lantern, a series of beautiful microscopic photographs taken by Dr. Maddox, some of them with the highest-power object-glasses. These marvellous productions excited universal admiration. At the request of the Chairman, Dr. Wright gave a description of the various objects, apologizing to the meeting as, although he could not refuse acquiescence in the expressed wish of the Chairman, yet an entire ignorance of what was about to be shown necessarily precluded him from knowing whether he might be enabled to afford much information. Dr. Wright then described the various specimens of Diatomaceæ exhibited on the screen, giving a succinct account of the history of these shells, and how they form an important link between the fossil and active periods of life. He mentioned their universal distribution, and how many of them were so minute that in the slate quarries of Bilen there were no less than forty thousand million in a square inch of the material, which weighed but half an ounce. The gradual progress in development, from the independent shuttle-shaped shells, through the Licmophora and Meridion to the perfect circular shell, as in Coscinodiscus, and finally the beautiful Heliopelta and Arachnoidiscus, were mentioned; and the speaker pointedly referred to the wonderful power of the minute "blebs" of organic matter calleds arcode to attract indifferently from sea or fresh water the pure flint of which these shells were composed—a power beyond the skill of man. The history of the Holothuridæ, in illustration of the spicula of the Synapta exhibited on the screen, caused much amusement; and the description of these anchor-shaped flint appendages raised a reverential wonder at such a beautiful proof thus unquestionably shown of the wonders of Creative Will.

The following are among those which were most admired:—

Vegetable.—Seed of Eccremocarpus.

Diatomaceæ.—Actinosphenia splendens; Aulacodiscus formosus; Auliscus moronensis; Coscinodiscus (Barbadoes earth); Licmophora flabellata; Navicula didyma.

Echinodermata.—Echinus, section of spine, tr.; Synapta digitata (spicules and plates from skin).

Crustacea.—Canthocamptus furcatus; Cyclops.

Insecta and Arachnida.—Parasite of Beetle; Parasite of Field-Mouse; Parasite of Mole; Parasite of Sparrow, female; Acarus of Fig; Itch-insect; Flea of Mole, male; Flea of Mole, female; Flea of Pigeon, male; Eye of Beetle; Foot of Fly; Gizzard of Cricket; Hygrotus elegans (Water-Beetle); Leaf-insect; Scale of Hawk Moth; Spiracle of Cockchafer; Tongue of Drone Fly; Tongue of Rhingia; Tongue of Hornet.

Vertebrata.—Blood-corpuscles, Human.

The Chairman said that he regarded it as a great achievement in photography to render, with such perfection as they had seen on the screen, objects so small in size that four millions of them would be required to cover one square inch. Those Members who wished to see more of them might do so at Mr. How's place, in Foster Lane. There were a hundred of them, and only twenty had been shown.

After a vote of thanks to Mr. How and Dr. Wright,

Mr. Jabez Hughes then rose to read a paper on the Tannin Process. He premised it by saying that, if he had had any idea that the Meeting would have been so fully provided with interesting matter, he would not have obtruded himself or his remarks. But

The Chairman, interposing, said he was very glad Mr. Hughes did not know; for they would have been sorry to lose them. He might here, perhaps, with propriety refer to a resolution come to in Council with regard to papers. They had had a long meeting, and reviewed the whole state of the Society; and they had also come to certain Resolutions which would, he hoped, prove beneficial. The Resolution was to the following effect.—

> "That papers or communications presented to, or read at, the Meetings of the London Photographic Society shall be exclusively the property of the Society until after publication in the Journal of the Society."

He mentioned this now, because he had pocketed the paper he had just read, and he wished other gentlemen to understand this, and they would see the propriety of the Society's Journal first publishing all the papers. He believed that such an arrangement would be beneficial, and he hoped it would be strictly carried out.

Mr. Greenwood asked if it would be regarded as a contravention of the Resolution if a reporter's abstract of the papers were published before the appearance of the papers in the Society's Journal.

The **Chairman** said, he thought that an abstract might be published, but not a complete paper.

Mr. **Greenwood** said, Suppose I employ a shorthand writer to get a full report of the paper as it is read, will that be a contravention of the Resolution?

The **Chairman** said, That would be an infringement of copyright.

Mr. **Greenwood** said, that was altogether another question, and one on which there might be difference of opinion. His question now was not as to the copyright: he asked, as a matter of courtesy, whether they would regard the publication of a shorthand writer's report of a paper as contravening their Resolution.

The **Chairman** decidedly thought that such a course would be wrong, and ought not to be adopted.

Mr. **Greenwood**: Is the question open to discussion?

The **Chairman**: I think not, sir. I have stated the determination of the Council, and that I thought, in order to avoid adhering too strictly to rule, an abstract might be taken. I cannot say more, and I think we must now proceed to the next paper.

Mr. **Greenwood** was asking some further questions, when

The **Chairman** said he thought further discussion was out of order, and called upon

Mr. **Hughes**, who resumed. He remarked that when he (and doubtless many others) attended the last Meeting, at some trouble to himself, and found his time and that of others wasted, no paper having been provided, and when the Chairman made an earnest appeal to Members to aid in remedying such a state of things, he resolved that he, for one, would do something to prevent a recurrence of it; and therefore it was that he brought a paper before them, without any pretentions to novelty, but a simple statement of his own experiences in working a valuable process. He then proceeded to read the following paper:—

On the Tannin Process. By Jabez Hughes.

The tannin process was first described about three years since, in the sixth edition of Hardwich's 'Photographic Chemistry.' Its merits were quickly discovered, and it soon came into general use. The author, Major Russell, has been most untiring in his exertions to perfect it; and in his book on the subject, as well as in his numerous contributions to the photographic journals, he has laboured hard to remove the difficulties to its successful practice. The result is that the process has gradually displaced most others, and at the present time it may be considered the most popular method of producing dry plates. Like every process that has had general recognition, there has been a desire to improve it; hence a variety of modifications, alterations, additions, and variations of the original formula. These have often consisted in adding some other substance to the tannin, to improve its original goodness. With this view, honey, malt, glycerine, albumen, gum, sugar, gallic acid, pyrogallic acid, and many other substances have been proposed. Without calling in question the propriety of these additions, I propose to invite your attention to the merits of the original process in its primitive simplicity.

The process has pleased me very much by its simplicity and certainty; it has also another recommendation — namely, that, except the solutions of tannin and carbonate of ammonia (both of which are easily made, and will keep any time), there are no chemicals required but such as are necessary for the ordinary wet collodion. There is no getting a lot of unusual things about you just when you want to prepare your plates, no beating up of white of egg, no dissolving of gelatine, no sending out for this or that which you may not obtain; the ordinary materials indispensable for amateur or professional work can at once be used without preparation.

The collodion I have employed has been such as is fitted for ordinary negative portraits; that made by myself, containing 4 grains of an iodide to 1 grain of a bromide, has answered well. I have also used Mawson's, both alone and mixed with my own, with equally good effect. I think any good commercial bromoiodized collodion will answer, provided it works well in the wet process, and gives a dense creamy film. I confess to a partiality for creamy films; in the wet as well as the dry process, I think they are exempt from many of the evils to which more transparent films are prone. I am aware that, in expressing my approval of a collodion containing a much larger proportion of iodide than bromide, I am at variance with those advanced workers in tannin, Major Russell, the late and esteemed Mr. Glover, and Mr. Sayce; but I know these gentlemen will exonerate me when I say that I do not urge my mode of working as being better than theirs, but I am only narrating my own experience. I am quite open to correction, and desirous of information. As yet I have not experimentally compared the results of an almost exclusively bromized collodion, such as these gentlemen use, with the usual bromoiodized one employed by myself. I hope to have that pleasure, when, if I am convinced of its superiority, I will willingly abandon my present practice; but, in passing, I must confess that I am not prepossessed in its favour by my few attempts with an exclusively bromized collodion.

I have not found it necessary to use any coating of gelatine or india-rubber to my plates before collodionizing, as the films have remained intact during all the necessary washings. I simply coat my plate in the usual manner, using a pneumatic holder, and allowing the collodion to flow to all the corners; when the film is set, the plate is immersed in the usual 30 or 35-grain nitrate-of-silver bath, such as is prepared for taking portrait negatives. The bath is faintly acid. I have prepared plates in a bath containing as much as one drop of strong nitric acid to each ounce of solution; and, though I did not gain the advantage I sought in the experiment, I am not aware that the plates prepared in the bath were any the worse for the extra quantity of acid: from this I conclude that a considerable quantity of acid may be present in the bath without being prejudicial to the dry plate.

The plate is allowed to remain the usual time in the bath; when sensitized, and all apparent greasiness removed, it is taken and immersed in a dipping-bath of distilled water. In this it is allowed to remain until another plate is sensitized, then washed for about sixty seconds under the tap, next flowed over with a 15-grain solution of tannin, and in this state set aside to dry.

These operations, thus easily described, are almost as easily performed; yet a few words in explanation will be in place. If, instead of putting the plate in distilled water when it comes from the bath, it be washed directly under the tap, it will certainly not turn out satisfactory, as there will be an irregular formation of chloride and carbonate of silver in and on the film. Immersion in a dish of common water will not be much better; but by first soaking the plate in distilled water, the greater part of the nitrate of silver is dissolved out, and the remaining washing can be done by common water. It is well to change the distilled water from time to time; how often, depends on the size and number of the plates, as well as on the quantity of distilled water employed. In sensitizing my usual-size plates, 10 x 10, I change the water, about 80 ounces, for every six plates.

I have said, wash the plates for sixty seconds under the tap after coming from the distilled water. You may say, Why sixty seconds only? and why not longer?

Well, I do not find any advantage in prolonged or excessive washing, but often a disadvantage; it is sufficient if the plate is washed enough. If the plate is insufficiently washed, when the tannin solution is poured on, the film will turn brown. The first place where this *browning* takes place is at the thickened edge of the film, where the collodion was poured off. This is the place to look to judge of the sufficiency of the washing: if this portion of the film keeps its pure colour, it is washed enough; if it turns brown, more washing is necessary, and very probably the distilled water requires changing. If this browning is confined to the thickened film on the edge, the plate may be safely used; but not so if the colour has extended over the film.

The evil tendency of overwashing is to produce fog. This is a statement for which one is scarcely prepared. That deficiency of washing should produce fog seems feasible; but that excess of washing should cause it appears very singular. Yet sufficient testimony of independent workers has accumulated for us to consider this point settled, that is, so long as a collodion is used containing a bromide. Major Russell has given an ingenious, and, I have no doubt correct, explanation of this circumstance, and those who are specially interested I refer to the Major's recently published articles on the subject; but, as the discussion of it can be dispensed with on this occasion, I pass on with the recommendation not to wash the plates longer than is necessary to prevent browning of the film on the application of the tannin.

I have named a 15-grain solution of tannin: it is probable that other degrees of strength may at times be desirable; but having succeeded so well with this strength, I have thought it good to adhere to it. I have found samples of tannin differ, not only in solubility, but in other qualities; I therefore suggest, when things do not work well, to try a different sample of tannin. It is important that the tannin-solution should soak well into the film, so that all parts are equally imbued with it: unless this is done, there will be marks and stains in the negative. I have generally held the plate with a pneumatic holder, and poured on the solution, allowing the first portion to flow off, carrying with it the surface water; a second portion has then been poured on, which I have allowed to flow backwards and forwards until I have thought it incorporated with the film. More recently I have adopted the plan of immersing the plate in a dish containing the solution of tannin, and allowing it to remain soaking until the next plate was ready. By this means all risk of stains and draining-marks are avoided. I intend trying a dipping-bath, as being a very convenient mode of immersing; and I think the tannin solution may be used indefinitely by occasionally strengthening and filtering it.

I have tried washing off the tannin before drying the plate, but have not been so well satisfied with the nature of the image. I have therefore returned to the original instructions of allowing the tannin to dry on the plate.

I have not used artificial means for drying. The plates are prepared in my dark room in the evening, and, resting on folds of blotting-paper, either in the rack or against the wall, remain unmolested till the morning, when they are found to be dry. The edges are then varnished, about an eighth of an inch all round, with the common asphalt black varnish used for glass positives, which answers remarkably well.

The plate is now ready for exposure; and to the natural question that may now arise, "How long will it keep?" I can only give the innocent answer, "I don't know."

I have ordinarily used the plates soon after being prepared, say within a week or ten days; and the longest time I have kept them has been about six weeks: to that time they were quite perfect, and I know no reason why they should not keep much longer.

I have no doubt that zinc or mahogany is the best to keep them in; but I have used only the regular deal plate-boxes, and I am not aware that I have suffered by the practice.

With respect to the time required for exposure in the camera, I am sorry I cannot say, as some have done, "Give the same as for wet plates." I have tried them many times against wet collodion, and with alkaline development they have required twice the exposure of the wet plates developed with iron; if developed with acid pyro, they required six times the amount of exposure. I always have in view the kind of development I intend to use when I expose; and I like to give as long as I can to each subject, knowing that, while over-exposure may be modified, there is no remedy for under-exposure. When the conditions permit, I prefer to continue the exposure long enough to suit the acid pyro developer; but when I cannot do this, and quickness is essential, I then give as long as I can in the camera, I use the alkaline pyro developer, and—hope for the best. It is not always necessary that a person should work quickly; there are many subjects to which you can give five minutes, just as well as you can give one. When a picture is under-exposed, and we try to make it up by developing, I look on the developer as being over-taxed—as being called on to do not only its own work, but some part that light ought to have done too. No wonder, then, that the developer fails. I think it better to proportionally distribute the labour, allowing the light to do its full share. I think it lamentable to put the sun on short time, or the plate on short commons. I sympathize strongly with a photographer when I see him struggling with an under-exposed plate, pouring his developer off, and on, anxiously staring into the deep shadows for the detail that won't come, and dreading the fog that generally does.

I employ Dallmeyer triplet lenses for my outdoor work, using as small stops as circumstances will permit. My exposures have varied considerably—with the negatives before you the average being about five minutes, using a No. 2 triple and a medium stop. One negative is here taken with a No. 1 triple, that had only 30 seconds; and a print is here from another, a No. 4 triple, that had 15 minutes; but the 30-second picture was assisted by alkaline development, and the 15-minute one had acid pyro. The quick developer was thus used for the short exposure, and the slow one for the long exposure. Where circumstances will allow, I think it good to use two plates to each view: not only are you more sure of having at least one good plate, but, by taking advantage of the different nature of the two developers, an error of exposure may be corrected in developing the second plate.

As the plates develope quickly, any convenient method may be used to hold them. They may be held in the hand, placed on a levelling-stand, or a pneumatic holder with a handle may be used. This latter is my method. Wet the plate well, so as to moisten the film; and if the plate has received the minimum of exposure, proceed to develope it by the alkaline method. Make up a solution of

Carbonate of ammonia....	40 grs.
Distilled water..........	20 ozs.

Filter, and it is ready for use; and it will keep indefinitely. Pour sufficient over the wetted plate to amply cover; after flowing over, return the solution to the developing-glass, and while there add to each fluid ounce about as much dry pyrogallic acid as will lie on a shilling; it will dissolve immediately, and will not need filtering. Return the solution containing the dissolved pyro to the plate, and the image will quickly reveal itself. Allow the developing to go on till the details are seen by *reflected light*; for on looking through, scarcely anything will be visible: wash the plate well, and proceed to intensify. This is done in the usual manner, with the acid solution of pyrogallic, to which is added, at the time of using, a few drops of (say) a 10-grain solution of nitrate of silver.

The following are serviceable solutions for use:—

Pyrogallic acid	2 grs.
Citric acid	1 gr.
Distilled water	1 oz.

or

Pyrogallic acid	1 gr,
Glacial acetic acid	½ drachm.
Distilled water	1 oz.

After the alkaline pyro has been well washed away, pour over the plate sufficient of the acid pyro solution to cover it: do this before adding the silver to it. The alkali that may remain in the film will thus be neutralized; return the solution to the developing-glass, add a few drops of the silver solution, and proceed with the intensifying. The previously weak image will quickly change into a strong and vigorous one. It is advisable not to make the image too dense in this stage, but to defer some portion of the intensifying till after the fixing in the hyposulphite. The fixing and successive washing completed, the plate had better be examined, and the little additional intensity required given in diffused white light. I attach importance to this recommendation, as a great deal of the actinic density of these dry plates depends not so much on the quantity of the deposit as on the colour, and this cannot be definitely known till the plate is fixed.

If the plate has had what we may term the normal exposure, it requires only to be well wetted, and either of the above acid solutions of pyro (to which at the time of using a few drops of the silver solution are added) to be flowed over the plate, and the development will proceed almost as quickly as in a wet plate.

It is desirable, in the first instance, to bring out the image with the least quantity of silver solution. The development can then be prolonged till all the deepest details are out, without the highest lights becoming intense. When the image is thus all developed, then is the time to add more silver and proceed with the intensifying, never, however, continuing it to the full extent, but leaving the final touches to be given after fixing. If the picture appears over-exposed, the greater part of the intensifying should be done after fixing; but if under-exposed, then as much intensity as can safely be given should be done before fixing, because intensifying after has a tendency to increase the contrasts in the picture.

The negative thus duly intensified has only to be dried and varnished, and it is ready for printing.

These negatives have always a more or less veiled or slightly foggy appearance; this is only seen by looking at them; on looking through, the shadows are quite pure and transparent.

I look on the development as being by far the most important part of the process, and the one in which there is the greatest scope for the exercise of judgment. It was the reproach of the tannin process in its early days that all the pictures were of wiry hardness. My experience shows that there is no necessary reason why the pictures should be hard. If the exposure be sufficient, it is all a question of development. The first object is to get out *all* the picture in the deepest shades before any strong density is produced in the high lights. This done, the intensifying can be calmly proceeded with. When, as in the old-fashioned way, the developing and intensifying were conducted simultaneously, there was always a danger of making the high lights too intense before the details were brought out in the shades. If, however, only the weak image be first produced, then the manipulator has it quite under control whether he shall produce a soft or a hard picture; for, if the exposure be enough, all weak pictures are soft pictures, and it is only as they are made too intense that they become hard. The exercise of judgment is required to know how far to go, so as to secure vigour without losing softness. When using the alkaline developer, there is no fear of the first or purely developing stage being past; for the developer, no matter how long you keep it on, in reason, will only make a weak thin image; it is in developing with acid pyro and silver the error may be made. If, however, only a very little silver be added to the developer, and patience be used, almost as weak an image may be produced by acid pyro and silver as by carbonate of ammonia and pyro. A well-developed weak image being obtained by either means, all the elements of a soft yet brilliant picture are secured, the rest being the exercise of skill in intensifying.

By attention to these points hard pictures may be avoided, and soft ones secured, not only by the tannin, but, I believe, by every other dry process.

A few words may here be said as to the merits of acid and alkaline development. I consider alkaline development to be a very valuable discovery, enabling us to bring out an image with certainly less than one-half the exposure otherwise required. This materially increases the usefulness of dry plates, and opens out untrodden paths of photographic discovery. The images produced by this means seem every bit as perfect as by the acid method; in fact, when the plates are done, I cannot tell the one from the other. I use the two plans according to requirements; for, while distinctly recognizing the value of the alkaline developer, I by no means pin my faith to its exclusive use. Where the circumstances are favourable, I still adapt my exposure to suit the acid method, as being the safer of the two. If I expose my plate for alkaline development, and I give too little time, I have lost my picture, for the acid method will render me no assistance; if I over-expose, then the acid method naturally comes to my assistance. In like manner, if I expose for acid development, and give too little time, the alkaline developer will be my friend. By this means I have two strings to my bow.

On the whole, then, I look on this discovery as a reserve of force—a something wonderfully useful to have recourse to when the usual means are quite inadequate; and as its usefulness is by no means confined to this process, I strongly recommend all dry-plate workers to add this new force to their powers.

I have already spoken of the image produced by alkaline pyro as being extremely thin and weak; it has been aptly termed a *phantom* image. Sometimes, with very short exposure, only the general outlines of a picture make their appearance. I have then found it advisable to increase the power by adding more dry pyrogallic acid to the developing solution. In rare cases I have used as much as ten grains of pyro to one ounce of the carbonate-of-ammonia solution, and have thus extracted a latent image that otherwise would not come forth. This, however, is a potent photographic spell for bringing spirits from the vasty deep that can only be recommended in exceptional cases, as there is always a much greater chance of raising the spirit of darkness—fog—than the image we desire.

I have not found any advantage in increasing the strength of the carbonate of ammonia above two grains per ounce. Carbonate of soda has never succeeded so well with me as the ammonia salt.

The virtues of hot solutions have been duly recorded for bringing out images with very short exposures; and, theoretically, a hot solution of alkaline pyro ought to be a most powerful developer. I cannot compliment myself, however, on my few essays in that direction; the results were rather humiliating than otherwise. Referring to these extreme and daring methods of development, I am reminded of an anecdote of three men who applied for a vacant coachmanship. A test-question was put to each—how near he could go to the edge of the road without going over. The first said he could go with perfect safety to within an inch; the second could go to a hair's-breadth; but the third said he always kept as far as he could from the edge, and preferred to drive down the middle of the road. When I have been pushing the development in some refractory plate that has had scarcely a gleam of light, hunting up the latent image that declined to put in an appearance, dosing it with fresh and more powerful stimulants, pitching it in hot and strong, defying fog, and treading on the very brink of destruction—under these circumstances I have thought that, after all, it would be safer "to drive down the middle of the road."

The appearance of the plate after exposure will sometimes suggest the best mode of development. If the image be visible on the plate when it comes from the dark slide, it has certainly been sufficiently exposed, so as not to need alkaline pyro. Sometimes on wetting the plate only, the image will spring forth; in such case also the alkaline pyro will not be needed. Also when the image comes out on the application of the carbonate-of-ammonia solution, before the pyro is added, the plate may be well washed, and the remainder of the development entrusted to the acid pyro and silver. In this latter case the acid pyro must first be flowed over the plate to neutralize any ammonia salt in the film before the silver is added. If this precaution be omitted in this and analogous cases, there will be a certain fogging produced.

In the absence of any of the appearances named, the judgment must be used as to which developer to employ. It is sufficient to say that it is always safer to use the alkaline than the acid pyro where there is a doubt, as, although a plate with abundance of exposure will always make a better negative if developed with acid pyro, yet, be the exposure ever so great, a picture can with care always be made from the alkaline-developed image.

I have only now to close by briefly summarizing what I have so circuitously stated. In short, then, I prepare my plate by cleaning the glass, coating it with collodion, sensitizing it in the silver-bath exactly the same as for taking wet negatives by iron-development; the sensitized plate, when taken from the nitrate bath, is put into a bath of distilled water instead of being put into the dark slide; it remains in this water till another plate is sensitized; then it is washed for about a minute under the tap, and a 15-grain solution of tannin is flowed over, and it is allowed to dry in darkness. When dry, the edges are varnished with black varnish, and the plate is ready for use. It will keep for certainly a month or two. If the exposure be sufficient, the development will be quite easy with the old-fashioned pyro developer and a few drops of silver solution. If the exposure is short, the development must be commenced with carbonate of ammonia and pyro, and finished with pyro and silver; and —this constitutes the whole process.

I cannot conclude without stating that I am glad of the opportunity of bearing testimony to its simplicity and great usefulness; and in the name of the workers in tannin (and their name is many) I thus publicly thank Major Russell for first introducing and perfecting the tannin process.

After reading the paper, Mr. Hughes exhibited a fine series of prints, from tannin negatives, of Osborne, and also a number of negatives, in illustration of his paper.

Mr. **England** asked if Mr. Hughes had been successful in rendering deep foliage by the tannin process.

Mr. **Hughes** said, Yes, he had. He especially remembered one little sylvan nook at Medina. Of course in such cases there must be plenty of exposure.

Mr. **England** said the subjects which Mr. Hughes exhibited, being chiefly architectural, were of course easier than foliage.

The **Chairman**, after examining some of the negatives, remarked that the degree of density varied. In one the sky was quite black, and could not be seen through, whilst another was comparatively transparent. There was also a patch, apparently wanting in sensitiveness.

Mr. **Hughes** said that he had selected the negatives as extreme cases, to show the various capabilities of the process. The plate with the very dense sky had received very long exposure, and was developed with acid pyro. The other sky had received a short exposure and alkaline development. But in both cases there really was practically a similar degree of intensity. In the thin one he started from bare glass in the deepest shadows, and did not need to have a very great density in the sky to secure the proper gradation and relation between the various tones. But in the other there was some deposit on the deepest shadows, and hence the necessity for a still greater deposit and greater density in the highest lights. There was, therefore, similar harmony in each case. He also took the condition of the deepest shadows as the key to the amount of intensifying. If there were little deposit, the highest lights need not be very dense. The patch, on which the plate appeared less sensitive, was due to an imperfect penetration of the tannin at that point.

The **Chairman** was glad to receive an answer so full and satisfactory.

Mr. **Allen** asked if Mr. Hughes had made any comparative experiments as to the exposure and certainty between the tannin and wet process.

The **Chairman** said he thought Mr. Hughes had answered that very fully in his paper.

Mr. **Hughes** said that, out of twenty plates with each process, he thought he would secure more good negatives by the tannin process.

Mr. F. **Eliot** asked if Mr. Hughes had experimented with different strengths of the tannin solution. He believed that, with subjects possessing much contrast, a three- or four-grain solution would give more harmonious results.

Mr. **Hughes** said he had simply described his own experience, in which he had adhered to the fifteen-grain solution. He had tried no other. He was perhaps wrong in so doing; but in his hands that had generally answered well.

Mr. **Eliot** said that, where deep foliage was to be rendered, an advantage would, he thought, be gained by using a weaker solution.

The **Chairman** asked the Meeting to give Mr. Hughes their very hearty thanks for such a practical paper, valuable in so many points. Such a response to his appeal of last month was a proof that Members only needed to be asked to induce them to respond in a degree corresponding with the wants of the Society, and so enable it to occupy the position it ought to fill.

A vote of thanks was passed by acclamation.

Mr. H. **Cooper**, jun., then proceeded to read the following paper.

On Printing with the Salts of Uranium.

By H. Cooper, jun.

Since I took up photography as an amusement, my object has always been the improvement of the printing, both in its artistic and manipulatory phases. It has generally happened that when I have been most sanguine of success I have been most disappointed; so that now I receive with some doubt any innovation until its capabilities have been ascertained to some extent. Although I am rather dubious of the great advantages claimed for the new Wothlytype prints, I am certain that the process contains the germs of many a useful alteration in our present modes of working. The disappointment of photographers has been so great upon finding that the process is so wanting in striking novelty, and also that the use of silver has been retained in it, that they are apt to overlook some very great beauties in the process, and refrain from "putting their shoulders to the wheel" to remove some of its existing defects, as it is only by the united and yet independent labours of several experimental and practical men that a process can be brought to perfection.

It was with very great reluctance that I was compelled to abandon for the present the carbon process. I say "for the present," as I have great hopes that, at a time not very far distant, we shall be in possession of a perfect carbon process, simple and certain. However, carbon is not our subject for this evening; but I hope to have something to say on some improvements in Swan's process in a month or two.

During the last few weeks I have been experimenting as extensively as possible with uranium printing; but as in so short a time it is absolutely impossible to carry out the hundreds of necessary experiments in each branch of the process, before the conditions most conducive to success can be laid down, I must ask you to accept this paper as an instalment of what I intend doing in this direction. All we can do at present is to record and compare the results we have each obtained, and attempt to deduce a few general principles, and thus aid the development of the capabilities of the process. The first and *most important* point is the paper, as it is almost entirely upon the paper that the quality of the finished picture depends. I have hardly met with a single perfect sheet at present. I have principally used a Rive paper, No. 47, which I had found to give the best results in my earlier experiments on printing. I am, however, far from satisfied with it for uranium printing; and although no definite conclusion can as yet be arrived at, I hear that those who are experimenting for the Association give the preference to the Saxe papers. The necessity for a suitable paper is of much more importance than for albuminizing.

Nearly the whole of my later failures I can trace to imperfections in the paper, the principal evil being a terrible mottling. If a mottled picture be held up to the light, each inequality of tone will be found to correspond with marks in the paper; and, again, if the collodion be stript from the print, you would be surprised to see what a very imperfect picture the paper itself contains. And the most vexing part of the matter is, that, even when we think we have at last got a perfect paper, we shall doubtless find many sheets in a ream very far from "up to the mark."

I have seen and heard many complaints of the delay of the Association, and I think I break no confidence by stating that *their* great difficulty has been in procuring a suitable paper. I hope, however, that the difficulty stands a good chance now of being overcome, as I received a sample of paper from Colonel Wortley that gave very excellent results.

As regards the sizing of the paper, my experiments have been very successful, doubtless on account of my having given, during the last three years, much attention to the sizing of photographic papers. I have used for uranium printing gelatine, gum arabic, gum tragacanth, and arrowroot. The last is the one that possesses the necessary qualifications in the highest degree, the collodion-film adhering much more tenaciously to a paper sized with a starch than with any other material I have tried; and starch seems to be the most suitable form of organic matter to facilitate the disruption of the oxygen and uranium under the action of light, and to give greater brilliancy to the reduced silver.

But here, again, fresh difficulties arise, from the fact that very seldom can two samples of arrowroot be found to yield precisely the same results. I must myself give the preference to the St. Vincent arrowroots; and I have it from a good authority that these arrowroots are most likely to be best fitted for our purpose. Most persons must have noticed the difference in arrowroots prepared for eating: sometimes, upon cooling, the gelatinous mass will become more limpid, and eventually "go to water" (as I have heard it expressed), while another sample will get stronger and stronger as it becomes cold. It is also necessary that it be free from dirt and all impurities. The St. Vincent is the finest and cleanest that we get; and it has also another desirable qualification, its cheapness compared with Bermuda and some other kinds. Great care and tact is required in using it for sizing photo-paper; and although I dare say many are fully acquainted with all the details and manipulations, yet, to try and save others, who are not so, from meeting with some of the failures that I have experienced in time past, I will, as briefly as is compatible with clearness, explain the way in which I have proceeded to obtain the best results. Take 200 grains of suitable arrowroot, place it in a basin that will hold about a pint, and having crushed the lumps in it with a spoon, pour a few drops of cold water upon it, and well rub together. Have ready, *boiling*, 10 ozs. of water; and now pour a few drachms upon the pasty mass in the basin, and, after well mixing, add the remainder of the boiling water, quickly stirring all the while. It is a great assistance to get another person to pour the water upon the arrowroot whilst the operator is stirring it. Should the contents of the basin be found to be transparent and perfectly smooth, it must be set aside till quite cold. If the arrowroot was of suitable quality, and the operation just described properly performed, it should be even thicker than when hot.

Some recommend to boil the starch; but I do not think this necessary unless too much cold water were added to the dry arrowroot, which would prevent it from becoming quite clear. Should this be the case, a boil-up will set all right. When cold, the upper portion, which is much thicker than the remainder of the solution, is to be removed, care being taken that no portions of it remain, as they would inevitably form streaks on the finished pictures. I should not wonder if some were to smile at my thus minutely describing a simple process that every cook might be supposed to be thoroughly acquainted with. But the fact is that arrowroot or any other form of starch, mixed with no more care than is necessary for the table, is very unfit for photographic purposes.

We now take a sheet of photographic paper, lay it upon a board, and well sponge the surface with the prepared arrowroot; finish by drawing the sponge *horizontally* over the paper. Now proceed with another sheet placed by the side of the former, and treat it in the same way. Upon returning to the first, we shall find the surface partially dry. The sponge is now to be passed over it, to efface the streaks, taking care to finish in a *perpendicular* direction. The paper is then hung up to dry. By adopting this plan of having two sheets of paper on the board at once, all loss of time from waiting is obviated. It is at this part of the process that a practised hand can tell if the arrowroot was of the proper strength and properly mixed. Should it drag in a slimy manner over the surface, it was too strong, and must be thrown away, and some fresh mixed, as it will be only a source of failure to attempt to thin the solution already prepared. When dry, the paper is to be rolled. Here again amateurs and those not accustomed to the rolling of paper will require a few trials before they can accomplish it successfully. I will point out one or two precautions to be observed. The paper is to laid face downwards on the bed of the press, covered with a piece of fine cardboard or a thin plate of metal, and then passed under the roller at a moderate pressure. If the paper then lie smoothly, the maximum pressure may be applied, which will produce a most beautiful surface. If the covering of cardboard be omitted, or if a great pressure be applied at first, the paper will be irrevocably spoiled by creases. Where practicable, the operation of rolling is greatly facilitated by placing the paper under pressure for twenty-four hours.

Having now described the mode adopted to prepare the paper, I must pass on to relate a few of my experiments. I have used fourteen or fifteen different samples of collodion, and I have come to the conclusion that upon the collodion itself depends a great difference in the results, not only as regards the surface, but also the entire character of the picture.

I received from Mr. Simpson a sample of pyroxyline that dissolved perfectly in three parts of alcohol and one of ether to the amount of 7 grains to the oz. I found this too thick, and diluted it till it contained about 5 grains to the ounce. After it was sensitized, a piece of *plain* paper was coated with it. It possessed a very brilliant surface, and printed to a rich brown inclining to purple, and toned rapidly and well. I then diluted it with more alcohol, still keeping it saturated with the sensitive salts; and now it gives sandy-red prints in the frame, which refuse to tone to anything except a ruby tint.

To sensitize the collodions, I added 50 grains of nitrate of uranium to each oz., and, when the collodion had taken up as much as it could, poured off the upper portion, and added 5 grains of nitrate of silver. Only about half of the silver was dissolved in the collodion. From the character of picture produced, I was inclined to think that the nitrate of uranium must contain a large proportion of free nitric acid. Finding this to be the fact, I mixed some more plain collodion and uranium, and introduced a few grains of carbonate of soda. After standing some time to settle, the upper portion was decanted, and the silver added. I then noticed that a shorter exposure was required, and that the prints were very much more brilliant. It did not seem probable that the great difference could be caused by the absence of free acid; so I made some experiments to try and ascertain the cause. I made an aqueous solution of the nitrate of uranium; and having arranged several test-tubes side by side, placed about 2 drachms in each. If a caustic alkali, such as potash or ammonia, be added, the oxide will be precipitated; and it is by dissolving the oxide thus formed in different acids that I have obtained some of the rarer salts of uranium. But if a carbonate (I used that of soda) be poured into the solution instead of the caustic potash, a double decomposition appears to take place, carbonate of uranium and nitrate of silver being formed, no precipitation being caused. The oxide precipitated by an alkali is soluble in this mixture of uranium and soda, as also in simple carbonate of soda. Of course in such a vehicle as collodion the decomposition takes place much more slowly, so that in a limited time only a trace of carbonate of uranium is probably formed; and it is to this salt that I am inclined to attribute the striking difference produced by the addition of an alkali to the collodion; and, again, when the nitrate of silver is added, a minute trace of carbonate of silver may be formed, which would also conduce to give greater brilliancy in the prints. On mixing the collodions with the nitrate of uranium, I noticed that some of the samples became slightly opalescent, whilst others remained clear and transparent. After the addition of the silver, the opalescence increased in those samples that were clouded before; and some of those that had remained clear under the action of the uranium became opalescent after the silver was added, only two out of the fifteen samples of collodion remaining quite clear. No deposit is formed by the clouded sensitized collodion, the substance causing the semi-opacity being in a state of regular emulsion. I believe it to arise from organic matter in the pyroxyline or solvents; and I have found the collodions containing it to work better than those that remained transparent.

There is a very marked difference in the appearance of the prints when they leave the pressure-frame, some samples of collodion causing the pictures to print of a beautiful green, others of a rich brown, and some of a yellow or orange tint; the last take the longest of all to tone, and it is very difficult to get them to assume the tint of a properly toned silver print. Those printing green or brown tone very rapidly. In some of my experiments the half-tones have coloured much more rapidly than the shadows: this, for landscapes, gives a very beautiful effect, the forcible foreground being of a rich brown or purple, while the distance melts into a tender grey. In other cases the shadows tone to a purple brown, leaving the middle tint of a roseate hue, which is often a very pleasing effect to obtain in portraits. Some friends would not for some time believe that the faces of some medallion heads I showed them had not been coloured, the flesh appearing by daylight of a pinkish tint.

To coat paper with collodion, I use a board with a handle underneath, very similar to the boards used by plasterers: and I also turn up the edges of the paper about the sixteenth of an inch; this enables the whole of the sheet to be coated without any danger of spilling the collodion, or allowing it to run on the back of the paper. After printing, the pictures are placed in diluted acetic acid, one part in thirty of water, until the high lights are perfectly clean and white; this takes from 10 to 15 minutes. After well washing (under a stream of water, if possible), they are placed in the toning and fixing bath. The necessity for some fixing agent, when silver has been used, has been so strongly and clearly pointed out in the photographic press, that I need not detain you by repeating the arguments used. Suffice it to say that some fixing agent must be used where silver is employed. The bath I am best pleased with is formed by dissolving 1½ oz. of sulphocyanide of ammonium in 20 ozs. of water, and adding from 1 to 3 grains of chloride of gold.

In using the sulphocyanide I have met with one or two very curious results, for which I cannot in any way account. I received from Mr. Simpson some of the sulphocyanide, and made a toning and fixing bath of 1 oz. sulphocyanide, 4 ozs. of water, and 1 grain of chloride of gold: as this worked well, with the exception of being rather too energetic in its action, I added 6 ozs. of water. After standing two days, I was much astonished to see that all the prints placed in it vanished entirely, leaving the paper perfectly white; and not only was this the case with argento-uranic prints, but the same effect ensued with silver prints on albuminized paper and with chlorized collodion. From the original bulk of sulphocyanide I made several baths, yet all with the same result. The most curious part of the matter is to follow. After the refractory baths had stood unused for about a week, they all worked quite satisfactorily. I shall be glad to know if any others have met with anything similar, as I can in no way account for the curious anomaly I experienced. After removal from the toning bath, the prints are placed in a dish of water for a few moments, and then well and rapidly washed. I am happy to say that I find no over-printing at all requisite. In my own later experience, the finished prints possess just as much half-tone as when they leave the pressure-frame; and in some instances I have even found details developed in the lights that were invisible before submitting the prints to the action of the toning bath.

From my somewhat limited experience I have deduced the following facts, to which I would beg to call your special attention.

1st. That no over-printing is required, except in very rare cases; and that the paper is generally even more sensitive than ordinary albuminized paper, the sensitiveness and brilliancy being in an exact ratio; that is to say, the more sensitive the paper, the softer the resulting image. Without doubt, a Wothlytype can be printed in much less time than a silver picture.

2nd. That the limits of tone and brilliancy are very wide. I can affirm with confidence that with no ordinary silver process can such a range from delicacy and softness to extreme hardness be produced from the same negative as with the uranium.

The manufacturers of albuminized paper have chuckled over the supposed difficulty of coating paper with collodion; but it is quite an imaginary one, as, with a little practice, whole sheets of paper can be coated as easily and more quickly than albuminized paper can be sensitized. I think the greatest advantage of all will be, that when the proper conditions to produce a certain result have been ascertained, it can be produced again with certainty; so that when a ream of suitable paper has been sized, and a large quantity of collodion mixed in bulk, prints precisely resembling each other will be yielded by the same negative; and as the fixing and toning bath is in one, any desired tone can be obtained.

This paper has grown to such a length that I must now perforce conclude it, though I have a great deal more that I should like to say about some other experiments connected with uranium printing. It seems to me that the subject contains matter for many a future evening's discussion; so that perhaps it would be better if I were to repeat my experiments before bringing them before you.

At the close of the paper, Mr. Cooper exhibited a number of very fine prints, showing great variety of tone and capability in the process. He also showed some silver prints from the same negatives, for comparison, from which it appeared that the uranium prints were in no respect inferior.

Mr. J. **Williams** explained that, in adding an alkali to nitrate of uranium, the precipitate was not oxide of uranium, but a uranite of the alkali—a salt formed by the combination of uranic acid with the alkali, and some very complicated bodies.

Mr. **Cooper** said, that, no doubt, would account for some of the peculiar results he had obtained.

The **Chairman** said that as the hour was late, and Mr. Cooper held out a hope of further details, it would be better not to enter into lengthened discussion; but he hoped they would give their very hearty thanks to Mr. Cooper for the interesting details and specimens he had brought before them, and to encourage him to proceed with the experiments the details of which they were promised. A vote of thanks was then passed by acclamation.

Mr. **Peter Le Neve Foster** then exhibited some copies of engineers' drawings by a new and patent process, the details of which were not yet published. No negative was required, the original drawing serving that purpose. The results were excellent and cheap.

Mr. F. W. **Hart** exhibited a small apparatus for decomposing old hypo solutions by electricity, and thus recovering the silver as a sulphide. He said,

"The short communication which I have the honour of submitting to your notice this evening is a description of the model now before you. I made it some twelve months since for the purpose of separating the silver and gold from hyposulphite fixing and other solutions not precipitated by chloride of sodium (I would here remark that hydrochloric acid is much to be preferred to common salt, which is generally used, for the precipitation of chloride of silver in washing-waters previous to toning and fixing, 7 cubic centimetres being sufficient for each sheet of paper, as usually sensitized). During that time it has worked with great satisfaction, and I now bring it before you, thinking it would be interesting and profitable to the Members and the photographic public at large.

"In the first place, we have the tray on which the solutions are poured and run into the precipitating compartment. On removing the outside case, we have two chambers disclosed, and a filtering apparatus I have adapted to the nature of the precipitates formed. In the smaller compartment we arrange a voltaic pair of plates in such a manner that the *cathode* shall be on the partition separating the larger from the smaller chamber, which we charge with a solution one part by weight of sulphuric acid to fifteen of water. On the other side of the partition, and in the precipitating chamber, an *anode of zinc* is placed, and opposite, in the solution to be electrolyzed, its corresponding *cathode*. The two pairs are then connected, and the electrolysis commences. It is important that the *anode* in the precipitating-chamber be of *zinc*, for this reason, that on testing the solution run off from the filter, with sulphide of sodium, after a few hours' action, any zinc in solution would not mislead, as it is the only metal which has a white sulphide, and the non-appearance of a black or brownish-black precipitate indicates the silver being all thrown down. The filter is then set in action by removing the compression-clip, and the useless solution run off. The average time for the complete process is about twenty-four hours. When the accumulation of precipitates begins to impede the action of the filter, they can be washed out into an ordinary funnel-filter, to drain and dry for the reducing to the metallic state. The sulphide of zinc formed and mixed with the sulphide of silver can be removed by hydrochloric acid; but I think it would be better left to the reducer to separate."

The **Chairman** read the following Rule of the Society, relative to the election of Officers:—

"All Officers of the Society shall be annually elected, with the exception of the Secretary and such Members of the Council as may not go out of office by rotation or otherwise. The mode of their election shall be by ballot. The Council, at the Ordinary Meeting in December in each year, shall declare the names of the Members of Council whom they recommend to retire, and lay before the Society the names of those whom they have selected to supply their places. They shall also declare the names of the other Officers they recommend for re-election, and cause a list to be suspended in the Meeting-room. In the event of any Member of the Society being desirous of proposing other names than those recommended by the Council, a written list of the same shall be delivered to the Secretary at or before the Ordinary Meeting in January; and the same shall be read from the Chair, and publicly suspended in the Society's room, with the list recommended by the Council; and no Member shall be eligible for election into the Council unless he shall have been proposed in the manner and form above specified."

In accordance with this Rule, he would now read the names of the retiring Officers, and those nominated by the Council for election and re-election:—

To Retire.	For Election.
Vice-President.	
Lt.-Col. Stuart Wortley.	Dr. H. G. Wright.
Members of the Council.	
Mr. Gassiot.	Major Gresley.
Mr. Pollock.	Mr. Shadbolt.
Dr. Wright.	Mr. Mayall.
Mr. Robinson.	Mr. Robinson.
Mr. Thurston Thompson.	Mr. Thurston Thompson.

Mr. **Hughes** asked if the consent of those gentlemen nominated had been obtained.

The **Chairman** replied that the Council had that evening taken the list of Members and they had impartially, after due discussion, selected the names of gentlemen either for election or re-election that they thought would most advance the good of the Society.

Mr. **Hughes** asked if the Annual Meeting would be open to Members for the discussion of general business connected with the interests of the Society.

The **Chairman**, having examined the rules, said that it would be open for any business connected with the Society, of which due notice had been given at the previous Meeting.

Mr. **Thomas** then exhibited and explained the advantages of his box tent. He had assumed at the outset that two persons were necessary to carry the apparatus necessary for taking large pictures. He had therefore so arranged his tent that everything could be fixed *in situ* ready for use, without any arrangement, the moment the tent was opened out. A tent, with complete equipment for 10 × 8 pictures, was exhibited, and excited much applause.

Mr. **Griggs**, of the India Museum, exhibited a metal block, together with a very sharp impression from the same, to be used as woodblock with type.

Mr. **Johnson** exhibited a series of views taken with the pantoscopic camera, and promised at the next Meeting to fully explain its mode of operation.

Mr. **England** exhibited an extensive series of stereoscopic views, of great beauty, which he had recently taken in Switzerland.

Mr. **Stuart**, of 68 Fleet Street, exhibited his recently published 'Royal Portfolio of Roman Views,' containing ten of the most interesting views in Rome.

Mr. **Bennett**, of Bishopsgate Street, exhibited a copy of Longfellow's 'Hyperion,' illustrated with twenty-four photographs of the Rhine, Switzerland, and the Tyrol, by Mr. Frith. This beautiful volume is intended as a gift-book of the season.

Mr. E. **Aldis** exhibited a remarkable specimen of enlargement by means of the lime-light taken from a carte negative. The picture was of large size; but the artist stated he should have found no difficulty in much increasing its magnitude, if it had been desirable so to do.

Mr. E. T. **Brooks**, of Newbury, exhibited some ornamental medallions, being reproduced from designs by himself, executed especially for the purpose, the portrait being punched out and pasted upon the previously printed border. They had altogether a very pleasing effect. The mounts may be procured of him by professional and amateur photographers at a very reasonable rate.

Mr. **Warner**, of Ross, exhibited an extensive series of very admirable enlargements, having all the sharpness of the originals, which were exhibited side by side.

The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors.

No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith.

The same proviso extends to communications to the Editor.

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Sir David Brewster on Photography.

We extract from the 'Daily Review' the following observations on photography, addressed to the members of the University of Edinburgh by Principal Sir David Brewster, on the occasion of the opening of the present session. After speaking of steam and the electric telegraph, he says:—

"The art of photography, too, one of the finest inventions of modern times, is an emanation from an university. It was the science acquired by Mr. Fox Talbot in Trinity College, Cambridge, that enabled him to convert a rude experiment into one of the most useful and fascinating of the arts. It is difficult to estimate the advantages it has already conferred on science and art, and to anticipate the social purposes to which it may yet be applied. To the fine arts it has been a generous friend. The arts of architecture, sculpture, and painting have in every age called into exercise the highest faculties of man. Fostered by power, consecrated by piety, and endeared by affection, their choicest productions have been preserved by the liberality of individuals and the munificence of kings; and the palaces of sovereigns, the edifices of social life, the temples of religion, the watch-towers of war, the obelisks of fame, and the mausolea of domestic grief remain unscathed, but by time, to attest the genius and taste of their founders. To the patronage of such noble arts, the piety, the vanity, and the holiest affections stand irrevocably pledged; and we should deplore any discovery, or any tide in the nation's taste, that would paralyze the artist's pencil, or stay the sculptor's chisel, or divert into new channels the genius which wields them. Instead of superseding, however, the arts of design, as some have feared, photography will supply them with perfect copies of every work of art, ancient or modern—with studies of drapery and of figure, and with scenes in life and nature which, if they possess at all, they possess imperfectly, and without which art must be stationary, if it does not languish and decline. But while the artist is thus supplied with every material for his creative genius, society derives a still greater boon. The home-faring man, whom fate or duty chains to his birthplace, or imprisons in his fatherland, will, without fatigue and danger, scan the beauties and wonders of the globe, not in the deceitful image of a hurried pencil, but in the very picture which would have been painted on his retina had he been magically carried to the scene. The outlines of the Himalaya and the Andes will stand before him in their most favoured aspect. The Niagara will pour out her mighty cataract of waters, while the dreaded volcano will toss into the air her clouds of dust and fragments of fire. At a lower altitude Egypt's colossal pyramids will rise before him —the temples, too, of Greece and Rome, and the gilded mosques and minarets of the East. With a more affectionate gaze he will survey the hallowed scenes which faith has consecrated, and love endeared. Mount Zion will stand before him "as a field that is ploughed," Tyre as a rock on which "the fishermen dry their nets," Nineveh "made as a grave," and Babylon the great "cast up as a heap," "covered with pools of water," and without even "the Arab's tent" or the "shepherd's fold." Yet though it is only Palestine in desolation that we see, the seas which bore on their waves the Divine Redeemer, the hills which bounded His view, the pathway which He trod, and and the mount from which He spoke the message of salvation stand unchanged, and appeal to us with an immortal interest. Within these few years the art of sculpture has derived a peculiar aid from photography. A member of a Scottish university had suggested "that all the elements of statuary might be obtained from a number of azimuthal representations or sectional outlines of a living figure taken photographically." Following out this idea, M. Willème in Paris has invented the new art of photosculpture, in which these azimuthal or sectional outlines are transferred by a photograph to a mass of clay, which becomes a correct copy of the living figure that the artist desires to perpetuate. By this wonderful process, which I have seen in action, busts, statuettes, and other objects in bronze, clay, plaster, and marble, &c., that have hitherto been the luxuries of the rich, will henceforth be within the reach of all; and our houses may be cheaply adorned with the busts of relatives and friends, and of those who, by their genius, their learning, or their virtues, are objects of interest or veneration. In order to work the patent, a company has been formed in Paris under the name of the Société Générale de Photosculpture de France, and a limited-liability company is now organizing in London for the same object, under the direction of Mr. Claudet, the most distinguished of our photographers. To the physical sciences and literature, as well as to the arts, photography has made valuable contributions. In the absence of the observer, it records the indications of meterological, magnetical, and other instruments. It delineates, with unerring accuracy, all the phenomena of astronomy, whether seen by the eye or the telescope; and it has imprinted upon its sensitive tablet what the human retina was unable to observe. To natural history it presents all the forms of animal and vegetable life; to mineralogy and chemistry, their unrivalled crystallizations, to geology the startling wonders of primeval times, to ethnology the various prototypes of our race, to anatomy the forms of death, and to pathology those of disease; for archæology it deciphers even, and preserves, the inscriptions of ancient times; and for literature—classical, political, and theological—it copies for study, and multiplies for preservation, the various manuscripts which have handed down to us the history and the knowledge of the past. Whatever, in short, the eye sees, the telescope descries, and the microscope reveals, photography delineates, multiplies, and preserves.

"Having thus estimated the value of the three great inventions which have emanated directly from our universities, and which might have entitled them to noble endowments, I may mention a peculiar and inestimable boon which they have jointly conferred upon the nation, by giving to the authorities the power of discovering and repressing crime. If the railway carries the criminal quickly from the locality of his crime, the officers of justice can follow him with greater speed; and if they fail, the telegraph pursues him in his flight, and the photograph identifies the fugitive."

REVIEW.

Hyperion: a Romance, by HENRY W. LONGFELLOW; *illustrated with Twenty-four Photographs of the Rhine, Switzerland, and the Tyrol.* By FRANCIS FRITH. Alfred W. Bennett, Bishopsgate Street.

Mr. BENNETT has just added the above work to the list of phototypically illustrated books which he has so successfully published. It is called "The Gift-Book of the Season;" and we cannot well imagine a more acceptable or appropriate present. In addition to well-printed letterpress and handsome binding, the photographs of Mr. Frith are perfect gems of art, and present to the reader a faithful rendering of scenery, which has never been surpassed. Considering the number of illustrations, Mr. Bennett has issued the volume at a most reasonable price, and we recommend our readers to possess themselves of it, rather than trust to our praise, however well deserved.

At the Anniversary Meeting of the Royal Society, on St. Andrew's Day, a gold medal was awarded to Mr. Warren De la Rue for his successful application of photography to astronomical science.

Mr. Sutton, of Jersey, intends to issue in his 'Photographic Notes' a new serial tale, to be called "The Photographers." It is stated that, in addition to the usual features of a romance, it will possess especial interest to the photographer; and some well-known photographers, professional and amateur, of both sexes, will appear in the plot.

A new Photographic Society has recently been started at Sheffield, and, from the names of the officers and promoters, no doubt every success will attend this undertaking.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

A Member.—The loss to the Society on the Exhibition has been about £100, independent of the printing of the Catalogue, which has been paid for out of the profits of the Journal, which have been very considerable. The loss on the previous exhibition amounted to about £190; and, with the exception of the Eighth, all have been more or less a loss to the Society.

M. M. L.—It is quite impossible to transmit Mr. Robinson's picture of "Bringing Home the May" by post; it will be delivered on application to any one whom you will appoint.

W. R. Holyoake.—The Journal up to No. 143 was forwarded to your address, and on November 26 the publishers sent the remaining numbers up to 151.

Member (2).—We cannot inform you if the new Company provide the materials at present, or if the collodion advertised by Mr. Sutton is the same as Herr Wöthly's formula. Probably the dull weather will account for your disappointment. Write to Mr. Brown, the Secretary, 213 Regent Street.

All Communications for the Journal should be addressed to the Editor, at the Publishers', Messrs. TAYLOR and FRANCIS, Red Lion Court, Fleet Street.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 153. JANUARY 16, 1865.

PHOTOGRAPHIC SOCIETY.

The Anniversary Meeting of the Society will take place at King's College on Tuesday, February 7th, at eight o'clock, when, in addition to the usual official business, a proposition will be made, "That in future the Ordinary Meetings shall take place on the second instead of the first Tuesday in each month."

Members may now obtain the photograph of "Bringing Home the May," on application to Mr. Mattress, at Messrs. Taylor & Francis's, Red Lion Court, Fleet Street.

Meetings of the Society, 1865.

1865. Tuesday,	Feb. (*Anniversary*)	7
,,	March	7
,,	April	4
,,	May	2
,,	June	6

We explained in our last Number that the Council have recently had under careful consideration the present position and future progress of the Photographic Society. It is thought desirable, for obvious reasons, that there should now be submitted to our readers the changes which it is proposed to make in future Numbers of this Journal, subject, of course, to their receiving official sanction at the next ensuing Meeting.

It has been felt that the time which elapses between the day of meeting and the date of the publication of the Journal is too long; that the Report of each Meeting should, indeed, appear in the same week in which it is held. The necessity for this is rendered still more urgent by the Resolution commented on in our last Number*. In undertaking the responsibility of faithfully rendering the matters brought under notice at the Meetings, it is felt due to the Members to ensure them an early as well as accurate account of the Proceedings.

To effect this, either the day of meeting or the date of publication of the Journal would have to be changed. There were many reasons which led to the belief that the former course would be most approved by the majority of the Members. But, before deciding on this point, it was determined that the present time would be a fitting opportunity for considering in detail all matters connected with the publication of the Journal, so that any alterations considered advisable might be made with the commencement of a new volume, at the annual period when the Society starts afresh.

A Committee was therefore appointed for this purpose, especially to consider any changes or modification which might be considered desirable in order to render the Journal more acceptable to its readers, and make it a record of all really worth preserving in relation to the subject of photography.

It is with regret we have to notice a most unscrupulous attempt to misrepresent the decision of this Committee. The following letter from our esteemed Vice-President, whose interest in the welfare of the Society is so well known and highly appreciated, will best explain to what we refer:—

To the Editor of the Photographic Journal.

Blackheath, Jan. 6, 1865.

Sir,—I have heard that it has been stated to the several advertisers in the 'Photographic Journal,' and others, that the Journal of the Society is about to cease, and that consequently it is of no use sending advertisements to appear in it.

Will you do me the favour to state that, so far from this being the case, the Council of the Photographic Society have appointed a

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* "That papers or communications presented to, or read at, the Meetings of the London Photographic Society shall be exclusively the property of the Society until after publication in the Journal of the Society."

Journal Committee, which includes the names of Dr. Wright, Mr. Davis, Mr. Sedgwick, Dr. Diamond, and myself, to improve the Journal generally, to publish it within two or three days after every meeting of the Society, and to increase its circulation.

Arrangements have been made to attain these objects; and the first number of a new volume, thus improved, will appear in March.

I am, Sir, your obedient Servant,
James Glaisher,
Vice-President.

Any one of our readers may easily imagine a parallel case affecting his own interests, and apply the epithet which his own feelings would suggest under such circumstances.

With the sanction of the Members, it is proposed that in future the day of meeting shall be changed to the second Tuesday in each month, so that a full and authentic account of the proceedings will be in the hands of the Members within the shortest possible time.

And it has been also determined that certain changes shall be made in the arrangement of the Journal, which will henceforth be increased in the number of its pages, and be of a uniform size in each monthly issue. Each volume will comprise one year's transactions, commencing with the number which appears in March, the year's report of the Council and the balance-sheet being issued as a Supplement with the February Number, and thus winding up the transactions of each year. Certain other alterations it is proposed also to make in the Journal, which, it is hoped, will give it increased value in the estimation of our readers.

LONDON PHOTOGRAPHIC SOCIETY.

Ordinary General Meeting.

King's College, London.

Tuesday, January 3, 1865.

J. Glaisher, Esq., F.R.S., V.P., in the Chair.

In the absence of Dr. Diamond, Dr. Wright undertook the duties of Secretary.

The Minutes of the previous Meeting were read and confirmed.

Mr. Maurice Griffiths Williams having been duly proposed and balloted for, was elected a Member of the Society.

The Chairman read the following rule referring to the election of Auditors:—

> "Two Auditors of the Accounts shall be elected at the Ordinary Meeting of the Society in January. They shall audit the Accounts, and produce their report to the Annual General Meeting of the Society to be held in February. They shall have the power of calling for all necessary accounts and vouchers. No Member of the Council shall be eligible as an Auditor."

He stated that last year Messrs. Heisch and Claudet were appointed Auditors, and it was customary, when no reason existed to the contrary, to elect them again for the same office. Perhaps some gentleman not connected with the Council would move a resolution to this effect.

Mr. Mayall then moved, and Mr. Johnson seconded, that Mr. Heisch and Mr. H. Claudet be appointed to audit the accounts of the Society for the past year. The resolution was then put and carried.

The Chairman said that an announcement had appeared in the Journal, stating that Mr. H. Cooper would read a paper on further experiments in uranium printing; but it appeared that the weather had prevented these experiments being carried out. This Society appeared to be more unfortunate in regard to promised papers than any other he knew. It was almost a pity that such announcements should be published on the faith of any gentleman's word, if there were any contingencies attending it. It was a painful position for the Chairman to occupy; but he had no control over such things. On the present occasion, however, it was of less importance, as a paper having a prior claim was provided for the evening. Mr. Haes would now proceed to describe his operations in obtaining his beautiful photographs of animals in the Zoological Gardens.

Mr. Haes then proceeded to read the following paper, in the course of which he passed round various fine examples of the photographs obtained, both in stereoscopic size and on plates 7 by 7.

Gentlemen,—It was suggested to me by your very worthy Vice-President, Mr. Glaisher, who is ever anxious to promote the interests of the Photographic Society, when I showed him the series of photographs now before you, that it might be entertaining to the Members to hear the troubles and difficulties I encountered this summer in producing the present series of stereograms and larger photographs of the animals in the Zoological Gardens; I will therefore at once proceed to give you the history of these pictures, but must inform you that, with regard to the method of working, I do not think I have anything new to communicate.

Casting about for some novelty at the commencement of last spring, we thought that a series of photographs of animals from life would be very useful and instructive; and having obtained the necessary permission, we removed everything requisite for working to the Gardens. I first took some views with a pair of ordinary single stereoscopic lenses, but, with three exceptions, I found that it was impossible to succeed in getting good negatives of any of the restless creatures in the Gardens; the exceptions were the Abyssinian Wolf, the Harpy Eagle, which is the largest of the tribe, and the Hippopotami, the last of which I photographed asleep: any persons present this evening who are frequent visitors at the Zoological Gardens, will understand why I preferred them asleep if possible.

Having received encouragement to proceed, it became necessary to decide upon the lenses; and I consulted with Mr. Dallmeyer, who advised me to use, if I could, a pair of his long-focus No. 1 B, which we had recently purchased, in preference to his stereoscopic lenses, as I should thus obtain results freer from distortion or exaggeration. I may here mention that I used a Smartt's tent, which gave me plenty of room; and as the summer was very hot, I contrived generally to pitch it in the shade; though even then, in the months of July and August, I had to hang up wet cloths, and keep the ground well moistened. The collodion used was Rouch's bromo-iodized. After trying various proportions of iron, and of acetic and citric acids, I at last settled down to the following for the developer:—

Iron	20 grains.
Acetic acid ..	20 drops.
Water	1 ounce.

I always found it necessary to intensify the negatives, and used pyro and citric acid as follows:—

Pyro	2 grains.
Citric acid	1 grain.
Water	1 ounce.

The bath was of 30 grains, slightly acid; and I believe the one bath would have served me throughout, had I not, one day on returning to the tent after washing a negative, had the misfortune to find that a gust of wind had overturned it, broken every bottle, and given the contents of my bath to be sucked up by the earth; fortunately, being of gutta percha, which material I prefer, it was not injured. The negatives were fixed with cyanide of potassium, 10 grains to the ounce.

You will readily understand that, to produce the fifty-five different subjects, a very much larger number of negatives had to be taken; for very frequently, after waiting ten minutes, a quarter of an hour, or even sometimes twenty minutes before (either by coaxing or menacing) we succeeded in getting the animal into a favourable position, and then exposing, the result was, that the plate was completely useless from drying. The exposure was with Dallmeyer's shutter, and usually as rapidly as it was possible to move it—I should say, about one-third of a second. Many of the slides speak for themselves on this point, those of the Zebra and Seal particularly; this latter, one gentleman refused to purchase, saying it could not be from life. In photographing this animal, I was much annoyed by the pertinacity with which the visitors to the Gardens would gather round the pond, chattering all the time, and of course attracting the attention of the Seal from the fish held just out of its reach; and I had great difficulty in persuading the teachers of a girls' school that it was quite as necessary for them to remove out of sight and hearing as to send away the children, they themselves remaining behind and talking their best. The Seal evinced a good deal of cunning, by not coming out of the water for a fish until two or three had been thrown in for it to taste, and even then snatching the fish from the keeper's hand and rushing again into the water.

Upon taking the camera to the Sable Antelope (of which the specimen in the Gardens is the only living one ever seen in Europe, and which is so shy in its native Africa that a full-grown one is a prize which rarely falls to the gun of the most experienced sportsman), I saw I should have plenty of trouble; for as soon as he caught sight of the camera, he leaped up and butted at the rails furiously; the keeper said he would injure himself by his passion. So to accustom him to the instrument, I left it in front of his yard during several hours for two days. Even then he would stand looking at it, which position did not, of course, give a good view of the animal, and we fruitlessly tried many ways to induce him to present himself sideways to the lens. Fortunately the keeper noticed that it was attracted by a light-blue coat which I wore; and this was forthwith transferred to the back of a lad I had with me, and, whilst the antelope watched him standing as I placed him, I succeeded, after a week of attempts, in securing the required position.

With the noble specimen of the Lion now in the Gardens I had not much trouble; and, as you see from the photograph, on the suggestion of the keeper I went into the den, which is double, with a sliding door, and to a certain extent managed to get a portrait which, I hope you will think, gives a fair idea of the grand head of a Lion: the exposure for this picture was eleven seconds. The Tiger is much more restless; and as yet I have only one negative of this handsome creature. The Cheetah is comparatively tame, as the slight wires in front of his den show. This animal is in a room, and was readily induced by his keeper to give me a sitting. Passing to the next in order, the Wolves, I question whether many persons have ever seen these animals quiet for a second; and when I first paid them a visit, they retreated to their sleeping-places. I found this was because they fancied my black cloth was the bag in which they were put when removed from one cage to another. Seeing, however, that I did not attempt to enter their cages, they ventured out; and I noticed that between one and two o'clock they were sometimes quiet for a few minutes; of course I made the best use of this knowledge. But no watching on my part has as yet enabled me to take the Dingo, or native dog of Australia. I pass over the Kangaroo tribe, only mentioning that the constant motion of the upper lip made it difficult to get a negative perfectly sharp. To obtain a good photograph of the Tasmanian Wolf (or tiger), it was necessary to go into the inclosure: these animals are very savage, cowardly, and treacherous; and a pretty dance they led us. The keeper at last despaired of ever getting one of them as we required; and in driving the animals about, one did his best to catch hold of my legs; however we at last tired out one and fixed him on the plate, though the position is not all that could be wished. Passing over that curious Marsupial the Wombat, next comes the Fretful Porcupine: these being nocturnal animals, are not always seen by visitors; the means adopted to induce them to favour us with a sitting were these: the keeper, armed with a stiff broom, entered their house and drove them out; and whenever the fine specimen of the crested porcupine tried to go in, the broom was pushed in his face; to this treatment he decidedly objected, and we thus got all his quills erected, and, whilst standing perplexed for a second, he gave me a chance which succeeded. I incautiously left one of the legs of my camera-stand in reach of the teeth of one of the smaller porcupines; and if the keeper had not removed it at once, it would, though very stout, have been very quickly destroyed. It was not considered advisable to attempt to bring the Beaver out, as young ones had just been born, it being the first instance of this animal breeding in captivity; and Mr. Beaver has the reputation of making a meal of his progeny if disturbed. The Capybara, or Water-Hog, the largest of the rodents, gave me no trouble: this animal has a particular dislike to children, though to grown persons he seems to have no objection: as you may see, I found him sunning himself in front of his grotto-like retreat.

Many persons remark, Of course you had no trouble with the Elephant; but they are indeed mistaken; this huge pachyderm is one of the most fidgetty animals in existence, and is perpetually moving trunk or legs. They have a curious habit of swinging the legs backwards and forwards; and the keeper who taught the animal to carry the saddle and to kneel when ordered, was baffled several times in his endeavours to make Jenny quiet; but she is certainly very sagacious. I used to feed her with apples, and she soon knew me well enough to go through the various performances at my command. Miss Bet, as the Rhinoceros is familiarly called, is not a young lady of very great amiability of temper, especially since the arrival of the young rhinoceroses, who, she evidently fancies, are a counterattraction to her charms. In fact, so uncertain is her temper that the keepers never venture into the yard when she is taking her daily constitutional. When she first saw the fresh arrivals, she was in such a passion that nobody knew how to calm her; and her strength is such as few can imagine. I found out that the rhinoceros could run at a good round pace when so minded; for one day walking with my camera covered with a bright yellow cloth over my shoulder, Miss Bet caught sight of it and charged full speed at me; fortunately the rails were between us. The little Babirussa had to be hunted from under his favourite heap of straw, and turned out into the yard, where we found him, like the curious Masked Pig of Japan, very restless; so that we adopted the same measures to get them quiet, namely, keeping them in motion for an hour at least, never allowing them to rest; and during the intense heat of midsummer this preliminary exercise was not much relished by us; neither did the piggies seem to appreciate it, wondering, I fancy, why they could not be left alone in peace. The Babirussa has very formidable tusks, and the injury he could inflict would be very serious.

The Solidungula are well represented in the Society's collection, the Zebras, Quagga, and Wild Asses being very interesting subjects for the camera. The Zebra I photographed is the one which was treated by Rarey, though at present his behaviour is not such as to make one think he has derived much benefit from his instructions: here again I was cautioned not to give them a chance of getting at my tripod. The Dromedary in the Gardens was born on the heights of Balaclava during the Crimean War. I have seen many hundred dromedaries in Egypt, but never saw any so fat as this. Neither the Dromedary nor the Camel was very troublesome; but one of the difficulties constantly occurring with all was, that, after drawing up the slide all ready for exposure, the animal would move a few feet, not sufficiently to make it necessary to refocus, but enough to oblige me to rotate the camera;

so that I was often very uncertain on what part of the plate I should find the picture, it sometimes resulting that the animal would be cut in halves by the division in the camera. The Llamas and Alpacas have, unfortunately for photographers, always been accustomed to be together; and on shutting one up in order to take them singly, the animal would turn its back to the lens; so there was nothing to be done but to let the other out. The Deer-sheds are not favourably situated for the camera; and these animals become very savage in captivity, especially when their antlers are hard.

The Giraffes, meek-looking, with large lustrous eyes, are, however, very stupid animals: the keepers say they do not show any intelligence; and this is corroborated by the animals often plucking the artificial flowers from a lady's bonnet and devouring them with apparently as much relish as a real bouquet; they can give very powerful blows with the head, which they swing against an offender. It is amusing to see them take food from the ground; but I believe nothing but a few lumps of sugar will tempt them to the exertion.

Of the behaviour of the Eland, about which (as making a very acceptable addition, if acclimatized, to our dinner table) so much has been said, I cannot report favourably; and indeed, if they were not more amiable than the specimen belonging to the Society which I photographed, I should not care to meet a drove in our streets. Some good-natured individual who was watching and talking to me while I was intent upon getting this animal into a favourable position, would persist in finishing every sentence by saying, "Well, I'm sure you'll never do it," till at last I requested him to leave me, thinking one brute enough to manage at a time.

The splendid Piedmontese Bull, presented by the King of Italy, was not much trouble. Not so, however, the Brahmin Bull, who is quite a family character, and did not at all approve of his temporary separation from his wife and son. Talking about cattle, I remember Dr. Farre, who is well known as a distinguished photographer, saying that he found the tails of a herd a very good test of instantaneous photography. The shaggy little Bison would plant himself so near the camera that I could not avoid distortion; but he was equally deaf to threats or entreaties to give me a better position. The Yak, or Ox of Tartary, is a quiet creature, not caring about being disturbed. I have portraits of both father and son. The Brindled Gnoo, or Wildebeest, was truly a wild beast. Those who have seen its behaviour at the Gardens may have some idea of the trouble it was to photograph it, a favourite position being with its head almost between its legs, and butting at everything, all this being done to hide its natural inquisitiveness. The Punjab Wild Sheep, sitting quietly in the corner, looks almost a member of the Peace Society; but one of the keepers, unfortunately, can testify that it is not always to be trusted; for it one day flew at the man, jammed his fingers against the palings, and one of the fingers was obliged to be amputated.

I must not forget to mention the Orang-outang, which the Society allowed to be removed from the Monkey-house for the purpose of being photographed. Everybody in sight of course flocked round us at the novelty of Miss Susan taking a walk with her keeper: we put her on her favourite chair, and she sat (with that curious old-fashioned face of hers) looking at the crowd. After developing the negative, I sent a message to the keeper to come and see it, and he brought his charge with him; he looked at it, and then the Orang quietly put its paw on my arm and drew it down, so that she could also see; it was indeed a grotesque parody. I can assure you that Susan gave me much less trouble than I have often experienced with Bimana of the genus Homo. The Cashmere Goat was a contrast to the last-mentioned; for he butted at everybody and everything, and nearly knocked his keeper over. The remainder of the present series consists of the large birds, The Ostrich is good-tempered and inoffensive enough; but the same cannot be said of either the Cassowary or Mooruk, both of which are very spiteful; the former gave me a great deal of trouble and the least satisfactory results of any of the series: as both of these birds kick very severely, it is necessary to keep out of reach of their legs. The natural curiosity of the Emu was quite sufficient to give me a very good opportunity, notwithstanding a crowd. I remember a tame Emu belonging to Government House in Sydney, which would persist in closely examining the details of a large traction-engine which was being exhibited, and, though repeatedly driven away, always returned, not showing the least fear at the noise of the machine in motion.

The last of my animals is the Tortoise, which would of course always move its head just as I was ready to expose; but having at last caught him napping, I obtained what I required, and so finished my first series of Zoological photographs, after three months' hard work.

Gentlemen, I thank you for the kind attention you have given me. Notwithstanding my endeavours to the contrary, this, I fear, must necessarily have been a very egotistical paper;

and I am only afraid I have occupied your time without giving you a *quid pro quo*.

At the close of the paper, Mr. Haes said that Mr. Highley would now exhibit transparencies of some of the subjects, by means of the magic lantern and oxyhydrogen light. It was only fair to Mr. Highley to observe that he had been very much hurried in producing the transparencies, having had the negative in his possession for the purpose only twenty-four hours. The transparencies were untouched.

The pictures were then projected on the screen, and elicited much admiration.

The Chairman, after inviting discussion, remarked that they had all doubtless been much delighted with the beautiful results they had just seen produced by their art. Mr. Haes had spoken of going into the lion's den, in order to secure a satisfactory portrait; for his own part he would rather go into the car of the balloon, although that was no joke during the present weather. All had, however, to face danger and duty, each in his own way. It would be difficult to over-estimate the value of these photographs as means of instruction for those who had no opportunity of seeing the living specimens. He was especially struck with the fine and life-like effect of the attitude of the animals, so different to what had been common in pictures. How graceful and easy in *pose* they were! To artists they must possess an especial value, and also to naturalists for examination and comparison. For these purposes they should be examined in the stereoscope, in which they appeared very natural and beautiful. Messrs. McLean and Haes had been requested to publish them in *carte* size only. This would have limited their value as a source of instruction, which in the stereoscope was very great. They would also be very valuable in the magic lantern, for class-tuition and for lectures, especially to clergymen, who frequently selected natural history as a suitable subject for interest and instruction. How the projection of such a lion on the screen as that they had just seen would speak to the audience! Failing the animals themselves, the next best thing was to see them on the screen, and the next best thing to that was to see them by means of the stereoscope; and very great credit was due to Mr. Haes for the trouble he had taken in producing such a series. He understood that Her Majesty had seen them, and expressed her high approval of them, and he hoped Messrs. McLean and Haes would complete the series for the stereoscope. To mechanics' institutes and schools of art they must prove of very great value. Personally he had been much gratified in examining them. The sharpness was very remarkable, and the position, proportions, &c. of the animals were admirably rendered, and reflected great credit not only on Mr. Haes's ability, but on his patience in dealing with such untractable animals. Those which had pleased him most were the Tiger, the Cheetah, the Wolf, and the Seal; the latter was especially fine. He might also mention the Zebra, the Dromedary, the Sable Antelope, and the Eland. In proposing a vote of thanks to Mr. Haes, he would again express a hope that he would continue his labours with renewed success, the result of past experience.

Mr. Mayall said he had pleasure in seconding the vote of thanks; but he should not have risen except to point out an omission on the part of the Chairman in not having mentioned that these animals, or many of them, had been very successfully photographed some years ago by an early Member of the Society: he referred to the Count de Montizon. He thought they ought not to ignore these early exertions, undertaken under more difficult circumstances than were possible now. Mr. Haes spoke of being engaged three months in the Gardens. If he remembered rightly, the Count was engaged eighteen months. His pictures were (many of them) very fine and well worth preserving; and if the Society did not possess a set, he thought they ought to make an effort to secure one for future reference. He did not mention this to detract in any way from the merit of Mr. Haes, nor to lower the value of his pictures, which were very fine. The difficulties were evidently under the best of circumstances very great. The animals were evidently opposed to photography, and had as great antipathy to the camera as artists themselves. Possibly, seeing that Mr. Haes had obtained the portrait of the lion Sir Edwin Landseer had been modelling, they might now hope to see the four shortly take their places in Trafalgar Square. He had pleasure in seconding the motion.

The Chairman said, the Count did not produce pictures equal to those before them, as he had not the means. He had in his possession the whole or greater part of those of the Count; they were quite as remarkable in their day as those of Mr. Haes; but the latter strikingly showed the advance of the art. It was not from intentional neglect that he had not referred to the labours of the Count. He had pleasure in offering the thanks of the Meeting to Mr. Haes, and he hoped he would shortly again go into the lion's den and add to his interesting results.

The Chairman then read the following letter from Mr. How.

2 Foster Lane, January 3, 1865.

Sir,—I have thought it would not be out of place on the present occasion, knowing that so many amateurs as well as professional photographers are using the oxy-hydrogen light in the enlarging process and for other purposes, to submit to this society what is (in my estimation) the most efficient and safe form of retort for the preparation of oxygen gas from chlorate of potash and oxide of manganese, as with it there is but little possibility of the recurrence of an accident similar to that which has so lately occupied the attention of the public. (I allude to that deplorable event which occurred but a few weeks since in Manchester.)

The retorts usually employed in the preparation of oxygen gas are made of either copper or iron, the form being spherical, or more commonly conical; the tops are made to screw off and on for the introduction of the material required for the manufacture of the gas, and also for cleaning out the exhausted composition. So far, so good; and no accident can possibly happen, supposing that certain necessary precautions be taken, such as having the substances well dried before mixing, and kept free from damp till required for use, having all the pipes from the retort to the gas-bag not less in internal diameter than half an inch. But if the materials be damp, the chances are that the small pipes such as are generally used would become immediately choked, and, the generation of the gas being continued, something must give way, and an explosion is the result.

The purity of the materials employed is of course of great importance. In the Manchester case, I think that the carbon found with the oxide of manganese must have been introduced by accident or through carelessness, as I can hardly imagine any person fraudulently adulterating a substance of the kind, the retail price of which is 3*d*. per lb., and the wholesale considerably less.

By making use of a retort of the shape which I have the pleasure of submitting to you this evening, no accident can possibly happen (even if the material be wet and the pipes choked up), worse than the head of the retort being blown off, and the contents wasted.

The mouth of the retort is of large diameter, and turned perfectly true on the outside of the neck in a lathe, and with a slide rest. The head is made of gun-metal, and turned equally true to fit on the neck of the body, which is of iron, and then both are ground together, and made perfectly air-tight.—I am, Sir, yours, &c.

James How.

An example of the retort was also placed on the table.

Mr. **Sebastian Davis** said, the recent fatal explosion at Manchester was not, he believed, attributable to the retort. It was conjectured that some organic matter had been mixed with the oxide of manganese, by which hydrogen had been generated, producing by mixture with the oxygen the well-known explosive compound.

Mr. **Mayall** said that the instrument exhibited was much too small for practical purposes. The top moreover would, he thought, simply act like a bullet if any explosive force were applied, although it was true that it would be driven in a vertical direction. The instrument was, in his opinion, much too small for manufacturing gas on a large scale.

Mr. S. **Highley** said that, as the explosion at Manchester had excited much attention, and he had had much experience in the preparation of oxygen gas, he might call attention to one or two points. Two years ago he had a blow-up. This he ascertained was caused by the finely-powdered state of the manganese mixed with the chlorate of potash. As the latter melted, any little ebullition caused the fine powder to be blown over, and to fill and clog up the pipes, and, the gas finding no vent, an explosion followed. Fortunately he was using a safety-retort, and no serious consequences ensued; but it blew off like a small volcano, and the room and everything in it was covered with the fine powder. Since then two gentlemen of his acquaintance had had explosions, one of them having subsequently died practically from the effects. He now used the manganese in coarse grains instead of powder, so that there was no risk of it being blown into the pipe and thus clogging it up. In the retort he used, the pipe was very wide and the connexion formed of a piece of india-rubber tube, which was easily blown off with slight pressure, and so prevented the chance of a dangerous explosion. Two pennyworth of india-rubber tube thus formed a safety-valve. He had written recently to Mr. Fox as to the purity of the manganese he supplied. His answer was that every care was used, but he could not undertake to guarantee its purity. In a recent case, where a case was broken at the wharf, a boy asked permission to gather up some that was left disregarded. On trying it before using, it turned out to be sulphate of manganese—not oxide. Even analysis would not always be a guarantee of safety, inasmuch as the sample analyzed might be all right, and some other part of the bulk contain impurities, as it was a cheap material roughly shovelled about, and might easily become contaminated.

Mr. **Mayall** said that an impression seemed to prevail amongst some, that great heat was necessary to decompose the chlorate of potash, in order to produce oxygen. A piece of gas-pipe bent round, giving a few jets, would produce sufficient heat if a thin wrought-iron retort were used. To this might be attached a flexible tube, strong enough for ordinary pressure, but not too strong to prevent the gas getting at liberty if a dangerous explosion were imminent. The glandular oxide of manganese was doubtless better than that in powder, as it was less liable to clog the pipes. But he would lay especial stress upon the use of a low heat. In making oxygen commercially, a greater heat was often used, with a view to obtain as much gas as possible from the materials used; but it was unwise and unnecessary. Regarding this retort, he certainly should place his veto against it; he did not know whether due consideration had been given to the expansive character of the two metals, if it happened that the iron expanded most rapidly, the top would become fixed by that means. The top was far too near the fire, and the retort itself too small.

Mr. Highley agreed with Mr. Mayall as to the superiority of a gas-jet for making oxygen. It had another advantage: if the gas were coming over too rapidly, the gas could readily he turned down, and the generation of gas checked. He had worked with 15 lbs. at one time in this way.

The Chairman said, the Society was greatly indebted to those gentlemen who gave the results of practical experience, which was of the greatest importance in matters of this kind. He then called attention to some fine specimens on opal glass by Messrs. Helsby and Co., which were described by a name he was almost afraid to attempt to pronounce. They were said to be by a new process, but he had no information about them. He thought the inventors could not do better than describe their new process at an early Meeting. He had just had some other specimens put into his hand without any information or notice regarding them. A Chairman could not be expected to know their purpose by intuition. A rule had been passed, to the effect that nothing should be exhibited of which the Council had not due notice. There was, however, no rule without an exception; and if the author were present, he should be glad to hear any remarks on the pictures placed on the table.

Mr. Johnson said that the pictures were by his pantascopic camera. He had duly mentioned the matter to the Secretary at the last Meeting, and had understood that arrangements would be made to enable him to bring the camera before this Meeting. If there had been any informality, it was the result of some misunderstanding, as there had been no intentional or conscious neglect on his part. He then proceeded to exhibit and describe his camera, which was intended to take pictures embracing 120° on a flat plate.

The Pantascopic Camera.

The construction of the Pantascopic Camera is based upon the fact that, if a lens revolves about a pivot placed immediately under its optical centre, and if the image be received upon the interior of a cylinder placed behind and concentric with it, the image is stationary, notwithstanding the rotation of the lens. M. Martens, of Paris, applied this fact to taking pictures on curved Daguerreotype plates.

The necessity of having collodion pictures on flat plates led to many attempts to receive the image of the revolving lens upon such a plate. Messrs. Martens, Garella, Sutton, and Holmer have published or shown the methods by which they attempted a solution of the problem. There are others, as Messrs. Rawlinson (of Keswick) and Stuart (residing in India), who have merely shown more or less perfect results in the same direction, without making public the modes by which those results were obtained.

The Pantascopic Camera differs not only in most of its details from preceding published attempts, but essentially in the principle of its mechanism.

1st. Inasmuch as the peculiar motions of the plate and lens are given directly by simple mechanical means, instead of by complicated guide-curves, which are really the resultants of the two simple motions of the Pantascopic Camera.

2ndly. In the application of automatic movement to the instrument by means of a spring or falling weight, by which alone such an equality of motion can be obtained as to enable the pictures taken by a moving lens to compete with those taken by a stationary one.

3rdly. In obtaining perfect atmospheric effects by means of a diaphragm between the lens and plate.

Having thus alluded to the principle and chief points of novelty in the Pantascopic Camera, we may now discuss the arrangements by which that principle has been put into practice, and the novel results obtained.

Description of the Camera.—The instrument consists—

1st, of a box or camera proper, having in front the lens, and at the back an oblong opening to allow the light to pass to the sensitive plate. Attached to the bottom of the box, which is extended on each side to receive it, is a steel rail, which is made in three pieces and folds up at each end; this limits greatly the dimensions of the instrument, without impairing its efficiency.

The box is supported in the centre upon the shoulder of a pin, and at the extremities by two pulleys which run upon a brass ring forming the base of the instrument. The box is held down upon the base by a screwed nut on the pin, about which the camera freely revolves. The edge of the brass ring constitutes the disk, which gives the due motion to the carriage carrying the sensitive plate, by means of two strings passing round the edge.

On the top of the box are sights to enable the operator to see what is included in the picture, and to bring any chosen object central. Between the lens and the opening at the back is a diaphragm with two moveable sides; these serve to limit the width of the opening, and to alter its form, as they may be made either parallel or tapering. It is by means of this diaphragm that the atmospheric effects are produced, as, by the varying form of the opening, the relative exposure of ground and sky can be greatly varied in the same picture.

2ndly, of a carriage running on the steel rail by means of two pulleys. The carriage is covered by an endless cloth passing over two rollers; the cloth carries a brass flange, which enters into the opening at the back of the camera, and is kept in its place by means of a staple. At the bottom of the carriage, at each of its ends, is a bracket, to which a gimp string or wire is attached; the two strings pass round the edge of the brass disk, and are fastened to it.

3rdly, of the usual dark slide, which is placed in the carriage as in the ordinary camera.

The above is a general description of the instrument when it is to be moved by hand; but in its more perfect form a clockwork is attached below the camera. This consists of a spring and barrel, a fusee and gut, and a train of wheels giving motion to a small fly. The arms of the fly turn, so as to be made to present a greater or less resistance to the air, and thereby to regulate the speed of the instrument at pleasure. The arbor of the fusee carries at one end a driving friction-pulley, and at the other a square to receive a key. The clockwork is mounted upon a plate, which at one end swings upon a centre, and at the other is pulled by a spring, so as to press the driving pulley against the inner edge of the disk. On the clockwork being wound up, the pulley travels round the edge of the disk, carrying with it the whole instrument to which it is attached.

Motions of the Instrument.—The arrangements just described cause the camera, carrying the carriage and dark slide, to have a movement of rotation round the central pivot, which is fixed immediately below the optical centre of the lens, while the carriage has a movement of translation in the opposite direction from one end of the rail which supports it upon the camera to the opposite end. This movement is effected by the two strings, each of which is attached at one end to the carriage and at the other to the base. As the latter is fixed while the camera moves, the strings fold on one side, and unfold on the other, upon the edge of the ring, thus causing the plate to travel across the central opening of the camera proper. The dimensions of the disk have a definite relation to the focus of the lens, and thus determine accurately the rate of the traverse. On the perfection of this adjustment, and on the determination of the (practically) true optical centre, depends the degree of definition of the instrument.

In the latest form, the clockwork is enclosed in a tight box, so as to exclude all dust; and the front of the camera is made into a close hood or chamber, which serves to exclude all extraneous light, and at the same time to enclose the fly and springs, protecting both from injury, and the former from the action of the wind. The whole is extremely compact and portable, the box containing the smaller instrument taking pictures 7¼ × 4½, measuring only 13″ × 9½″ × 9½″; the larger one, for taking pictures 12 × 7, only 20″ × 14″ × 13″.

The CHAIRMAN said, 120° were more than the eyes could take in.

Mr. JOHNSON said, Undoubtedly; the head must be turned round. In answer to a question, he continued, the exposure was regulated by a small fly for the purpose. A total exposure of half a minute was practically equal to a second for each part.

Mr. COLE said, he should be sorry to say anything in disparagement of the very ingenious camera before them, especially when he looked at the charming specimens on the table. At the same time it must be remembered that in photography they required truth; and these pictures were not truthful. They reminded him of a well-known view of Venice, in which the grand canal, which was, comparatively speaking, but a few yards wide, looked like a sea. Speaking as an architect, he must object to see the dignity of architecture destroyed and the effect of buildings dwarfed. The height of the buildings in the pictures on the table appears lost, and altogether insignificant. This was especially illustrated in the view of the Houses of Parliament at Westminster. In these the height of the highest tower was 400 ft., but it looked as nothing compared with the breadth of the river; and in the view of Trafalgar Square, Nelson's Column looked little higher than a balustrade.

Mr. JOHNSON said that, if there were any weight in Mr. Cole's remarks, the reproach was to photography, not to his camera. It was the result of using a short-focused lens; and if a number of ordinary pictures had been taken with the same lens, and then mounted side by side, the same result would have been produced. Of course they were panoramic projection and not plane projection, and they could not be tested by the rules of plane perspective.

Mr. **Cole** would not represent nature nor art in panoramic perspective, but each with its own dignity, as seen in plane perspective. He would prefer a true picture to a panorama, and he would not extend the view laterally, so as to lose all dignity and grandeur in the vertical dimensions.

Mr. **Mayall** said, twenty years ago he had worked with a camera on a similar principle, that of M. Martens of Paris, requiring curved plates. Some years ago, when Mr. Sutton's camera was introduced to this Society, he spoke on the subject, and he was compelled to object to it. It had curved plates, curved baths, in fact curved everything. But in regard to the objections of Mr. Cole, he confessed he did not see much force in them. The views were taken with a lens of short focus, and gave objects in diminutive proportion. He was reminded of the couplet,

> "Why has not man a microscopic eye?
> Just for this reason—man is not a fly."

At one time it was the stock reproach to photography that it did not give artistic results, because it did not take in sufficient to make a picture, and photographic views were styled bits of pictures. They were now enabled to produce views embracing 120°, and they were met with the reproach that such views were not true. He thought that these were really pictures, and good art in the right sense of the term. Art was simply nature in its best form. Perhaps a picture in nature, or the combination of effects which would produce it, only existed for a moment; but the artistic eye (which was but a camera) saw that picture, retained and perpetuated it. The artist never dreamed of confining his picture to what he saw from one point without turning his head. These pictures reminded him more of the paintings of Turner than anything he had ever seen, and were, in fact, the only photographic landscapes he had seen he had ever had a desire to possess. These pictures got over difficulties which Martens's camera did not get over, and produced a more perfect result with less mechanical difficulty than he had ever seen. There was no distortion of any kind; and with a lens of longer focus all the reproach on the score of architectural dignity would be removed, and the pictures would be satisfactory in all respects. If he had had such an instrument many years ago in his attempts to depict Niagara, it would have been invaluable to him. He remembered that he then spent three months, and exposed fifty or sixty plates, to get one good picture.

In answer to a question from Mr. Mayall, Mr. Johnson's operator said he could produce a negative by this camera at the rate of one in a quarter of an hour.

Mr. **Mayall** said, twelve negatives in a summer's day would be very satisfactory.

Mr. **Allen** said, it was important that in discussing such a subject they should have scientific reasons, and not opinions merely. If the human eye looked at an object five miles distant, and then at one 100 yards distant, the eye must alter its focus. A lens could not do this, it had to define both these and all other planes at once. He thought that the camera and lens before them was really best suited for distant views not including near objects, as it could not do justice to objects at a few yards' distance and 1000 yards distant at the same time.

The **Chairman** said, this being fixed for a mean distance, the error was equally distributed. He was glad to see a camera like this, as it decidedly indicated progress in the art; and the pictures were, he thought, very beautiful.

Mr. **Peter Le Neve Foster** thought there could be but one opinion as to the mechanical ingenuity displayed in the camera. But the question of plane perspective and panoramic perspective required a fuller discussion before the question could be settled. Such a discussion would be a most interesting one, and would involve important mathematical principles.

Mr. **Johnson** thought that pictorial representation could not be literally confined to plane perspective. His pictures were, when properly examined, rigidly correct, and might be used for the purposes of topographical survey. He continued at some length in support of this view; but as his remarks were chiefly addressed conversationally to Mr. Foster, they were not generally heard.

The **Chairman** said that possibly it might be expedient to renew the discussion on another occasion.

Mr. **H. Cooper** wished to explain that he had made no promise of a paper, but had said that, if opportunity occurred to continue his experiments, he would state further results. Dr. Diamond had however announced a paper, and he then resolved to do his best to prepare one; but bad weather and ill-health intervening, he was prevented, and he had ten days ago apprised Dr. Diamond that he would not be able to read one that night.

The CHAIRMAN said, it was a painful position for a chairman to appear before a meeting with an apology instead of a paper. He hoped Mr. Cooper would be ready with a paper by the March Meeting.

Mr. Cooper said that by that time he would promise one.

After a few further remarks, the Meeting adjourned.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

SECOND MEETING
HELD IN
THE SOCIETY'S HALL, 117 GEORGE STREET,
DECEMBER 13, 1864.

Sir DAVID BREWSTER, K.H., President, in the Chair.

The Minutes of the preceding Meeting were read and approved.

Mrs. CAMERON, Freshwater Bay, Isle of Wight, was balloted for, and elected an ordinary Member.

Mr. JOHN POUNCY, of Dorchester, then read the following communication, which was illustrated by a number of specimens in different stages:—

MR. CHAIRMAN AND GENTLEMEN,—I have the honour to appear before you this evening as the inventor of Photographic Carbon Printing. It is now about seven years since I commenced working in this direction. So various have been the methods by which I have worked, and so numerous have been the results, that I fear I should exhaust your patience before I could relate a tenth part of my experiments, were I even to make the attempt.

A review of my past labours would call to mind many pleasing incidents, but many recollections of periods when I have been overwhelmed with failures and disappointments, so much so that I have sometimes been driven to despair, and almost without hope of success, staying up till 1, 2, and 3 o'clock in the morning developing pictures exposed during the day, till I have got in such a conglomeration of difficulties that I scarcely knew what course to pursue. Sometimes my pictures would not develope; at others everything would go on as I wished, and the picture appear beautiful; but the next moment all had vanished, and I seemed as far from accomplishing my desire as when I began. In this matter, as in all others where the object is worth pursuing, I soon found there was no royal road to success. Several times my health has broken, and, illness following, work had to be given up, sometimes for weeks together; nevertheless, by God's help, I have continued to the present, and hope this evening to prove to your satisfaction that I have not laboured in vain.

The process which I am about to bring more prominently before your notice is that of producing photographs direct from the negative in printing-ink, by which undoubted permanency is secured in addition to all the beauty and detail of ordinary photographs. My chief object will be not only to lay before you the working details or the methods employed, but also to show by actual experiments its advantages over any other process hitherto known. Herein, I think, you will perceive the difference between my actual experiments and the exhibition of a few specimens got up for the purpose of being seen and talked about only.

The first time I publicly announced the fact of being able to produce photographs in printers' ink, I requested to be put to the test. I adhere to the same principle this evening. Deeds, not words, I contend for. Consequently I shall be most happy to answer any questions in reference to my subject this evening; and if, Sir, you would like to convene a meeting, with any number of gentlemen, hereafter for further experiments, I shall be very pleased to meet them.

Now, Sir, as I have already hinted, it is next to impossible to give you details of all the steps by which I have been led to the results that I shall presently show you; yet a brief outline may not be uninteresting.

I must here remind you that I claim the original process by which the first carbon photographs were ever produced (this fact was first made known in Sutton's Notes, in March 1858), and I am willing to give five pounds each for any specimens of carbon photographs with satisfactory proof that they were produced prior to mine. It consisted in mixing various colouring-matters, such as carbon, logwood, cochineal, &c., with bichromates as the sensitive agent. You will find this mentioned in the 'Photographic Journal' of January 1859, and, as will be there seen, I produced pictures that could not be distinguished from silver prints. This process was most useful for reproducing copies of prints, engravings, &c., which, doubtless you know, has since been adopted by Col. James, of the Ordnance Survey Department, Mr. Osborne, and others, and by which process we have since had *facsimiles* of the Doomsday Book. But being very desirous of obtaining photographs from nature on stone, so that copies could be printed therefrom, I have worked very much in that direction, and endeavoured to make a greasy ink, in which I could produce a photograph direct from the negative, the sensitive agent in which is principally bitumen. In order to avoid the trouble of reversing the negative, I endeavoured to produce the picture on paper and then transfer to stone, so that my subject should not be inverted; but when I applied my greasy solution to the surface of albuminized paper, the whole appeared to be absorbed, and the back of the so prepared paper presented a finer surface than the front, on which the sensitive agent had been applied; consequently I placed the non-prepared surface of the paper in contact with the negative, and the result of the experiment is the picture before you, which you will perceive appears on neither surface, but in the paper. This was amongst my first experiments. This I believe to be the first photograph ever printed with the non-prepared surface in contact with the negative. Not succeeding to my satisfaction, I threw it aside, and again pursued my original course for a time. Still desirous of obtaining a good stone process, from which I could print not only *copies* but photographs from nature, I prepared the surface of the stone with bitumen and greasy matter dissolved in benzole, and, when dry, grained the prepared surface with fine dry sand, so that the light might have access *into* the surface of the stone, and also to prevent the picture from clogging in the after-operation of printing. This did not satisfy me. I next placed a veil between the surface of the stone and the negative. This required much longer exposure. I then added to the bitumen and greasy matter bichromate of potass, ground very fine in benzole and palm oil, as the little dissolved in spirit would not be sufficient. I was also dissatisfied with this. I next endeavoured to produce a photograph on mica, placing the non-prepared surface towards the negative, hoping, after development, to transfer it to stone. After many trials I threw this aside also, because, although I succeeded in obtaining a picture in greasy matter, it would not transfer to stone, there being no means of loosening the greasy picture from the mica. I again resorted to paper, and at this time tracing-paper, covering the surface with the greasy sensitive solution, and when dry exposing with the non-prepared side towards the negative, and then developed with turpentine. By this method I obtained very good pictures of any subject, with perfect detail and half-tone. I next endeavoured to transfer those pictures so obtained to the face of a finely grained lithographic stone, by rolling it through the press and damping the back of the paper with benzole, thinking the greasy matter would go into the surface of the stone, and leave the paper to be taken away; but this would not answer; the benzole, operating through the paper, caused the picture to spread and become blurred and imperfect. The next step was to prepare the surface of the transfer paper, so that the greasy matter which formed the picture and the paper would easily separate; this, of course, is very simple when we know the way. I then covered the surface of tracing-paper with a solution of gum arabic before applying the sensitive coating of greasy matter; so that when I had obtained the picture and rolled it through the press, on the face of the stone in the usual way, the paper came off very easy by damping; hence I could produce a photograph in greasy matter, on the face of a lithographic stone, as perfect in all respects as a silver print on paper. I consider this the most important step hitherto gained in Press Photography, it being quite certain that we cannot obtain perfect results from an imperfect transfer, which by no other process can be produced. This fact I made known at a meeting of the Photographic Society of London, November 4, 1862, but it appeared to contain little or no interest to those assembled. Having got thus far, viz. producing good photographic transfers in greasy matter for stone or metal, I considered it must follow as a matter of course that I could produce photographs in black or coloured greasy ink; for up to this point, be it remembered, colour was no object. I next turned my attention to the production of positives in printers' ink direct from the negative, to remain as such. Here the greatest difficulty was to procure a colourless transparent paper: it was then I began to work on sheets of gelatine. One of my early pictures on gelatine is now before you, and you will observe it presents the appearance of the negative having moved, this being caused by the gelatine having contracted. I shall have more to say with reference to gelatine before I close.

For a long time I worked with black ink only, which, with bitumen and bichromate of potass, was not at all times a pleasing colour. My next effort was to work with any coloured ink, so that any tint might be obtained. Here my difficulties at first greatly increased. I could not for a long time get various colours to develope clean, many of which require an increase of greasy matter mixed with them. After repeated failures and renewed efforts, I am now able to produce photographs in any colour or pigment. How far I have succeeded, the specimens before you this evening will prove, all of which comprise about ten different tints.

A sample of the paper I now work on is before you, which, after being made transparent, is coated with clear size or gelatine, and then with a coat of shellac varnish, before applying the sensitive ink. (The importance of this coat of size and varnish you will see more fully before I finish my remarks.) We next apply the sensitive ink.

This I hold in my hand is a piece of the sensitive-ink paper prepared in July last. It will keep sensitive an indefinite time, if preserved from light. Those large portraits now before you were printed from this making in November. It will keep also any length of time after exposure before developing, if required. Here is another piece which was exposed under a negative about a month since, which I proposed to cut in halves, one half to be sealed up in the presence of this meeting, to be developed this time twelve months; the other half we will now develope by immersing it in turpentine or benzole, or, what is much cheaper, mineral naphtha, with a little greasy matter added, finishing with clean turpentine, all of which can be used until very thick with ink and afterwards used for painting-purposes, or the turpentine distilled again for developing. You will now perceive that just in proportion as light has passed through the negative, so it has hardened the ink. The parts not operated on by light remain soluble and are now dissolved off. We now pin it to a board covered with blotting-paper to dry.

I next transfer the picture to another sheet of paper or cardboard, by varnishing the face of the picture when dry in the same way as we should gum or paste any ordinary photograph for mounting. In a few minutes the varnish will become "tacky" or partially dry, and then it is laid on evenly in close contact with the other surface, and afterwards screwed in a press. The press most suitable is that used for copying letters.

This picture, you will perceive, has the transparent tissue on its face, and after damping it with a sponge and warm water it will easily come off, leaving the picture on the other surface. This tissue can be used again, as you will presently see. Here you will see the good of the coat of size on the paper before the sensitive ink, which I just now alluded to, the water operating upon which separates it from the ink. Under-exposed pictures are no good: if over-exposed, they make good transparencies, and can be used for a variety of purposes—as a substitute for stained glass for staircase windows, hall doors, lamps, &c.; and by placing the photographs between two sheets of glass it would not be operated on by the sun, the material colour standing the effect of light. Those I now submit to your notice are over-exposed as positives. One feature they possess I beg to call your particular attention to—that, although possessing great depth of colour, the whites are perfectly pure.

Another method of mounting can be pursued by those who prefer it, which is to proceed as before, and, instead of removing the paper, varnish it with the same varnish as that used for transferring.

A third method of mounting can be adopted by reversing the negative, as follows:—Cover a piece of the transparent tissue which we have just removed with a varnish made by dissolving india rubber in benzole, also the film side of the negative; now place both together and let them remain till quite dry; then place them in a dish of clean cold water, when the negative will leave the glass firmly attached to the transparent tissue. It can then be placed in the printing-frame either side, and thus print without the subject being inverted. Here is a negative so treated, which will print as well as those on glass. Those who wish to produce negatives by this process can do so by first over-printing a positive and printing from the same a negative, which can be used as such.

Another class of specimens I wish to draw your attention to are those produced on gelatine, which, you will perceive, are widely different from the first I showed you. We should think that this material would require a shorter exposure, but such is not the case. Very good results are to be obtained, if the prepared sheets are kept perfectly dry; but I am not certain that it is superior to my transparent paper. The greatest difficulty I have experienced is in mounting. The most successful way is first to varnish the face of the picture with the transfer varnish before mentioned, and when dry again varnish with a varnish made by dissolving Canada balsam in turpentine, and when "tacky" press the picture in contact with paper or cardboard. This varnish any operator can easily make by obtaining Canada balsam and thinning it for use with turpentine. I have here also a specimen on mica, a material that can be used as well as paper or gelatine.

I have already detailed some of my experiments to obtain transfers for stone, which, as I have now shown you, was in reality producing positives in printing-ink. I now come to the application of the process as Press Photography, viz. for stone or metal, and printing therefrom. The specimens I now produce are some of the results.

Another important application of the process is for the decoration of china. The frame of specimens before you are all produced in ceramic colours, the whole of which can be transferred to and burnt on china, which I am prepared to do at any time, in the presence of any number of persons who feel interested in the matter.

I sent specimens of this kind to the Photographic Society of France in March last, and made the same offer, in competition for the prize founded by Le Duc de Luynes, to which offer I received no answer. I next show you a small plate in what is termed "biscuit"—that is, before the glaze is applied—on which you perceive the photograph is so transferred. The next step is to apply the glaze and place it in the oven usually employed; and the result will be a blue photograph on a white ground, the colouring-matter being oxide of cobalt.

This larger plate has passed through the latter ordeal. The photograph, before being transferred, was produced in the same way as those I have already shown you, substituting ceramic colour for printing-ink. By this process the good lady of the house will be able to have photographs of all the members of the family in her china tea-service; or any gentleman can obtain a dinner- or dessert-service decorated with various photographic views of his estate, his favourite horses, dogs, &c.

I have thus endeavoured to lay before you the various applications of my process, by which, as you have seen, I can produce in printing-ink of any colour, direct from the negative, photographic *positives*, *negatives*, *transparencies*, *transfers for lithographic or press printing*, *photographs in ceramic colours*, which can be transferred to and *burnt on china*, *earthenware*, &c.

I am bold to assert that this process embraces a wider field than any other system of photographic printing. It is true that I have spent much time and labour to arrive at these results. But, Sir, if by one pair of hands and this shallow pate of mine this process has thus far prevailed, who shall predict the limits or extent of its application when it shall have received the same amount of attention and talent that has hitherto been given to silver printing?

Mr. POUNCY concluded by mentioning that, in passing through Liverpool on his way to Edinburgh, he met a very energetic, persevering man, named Forrest, a glass-stainer, who told him that a friend had called on him a few days before, and shown him a picture burnt into opal glass. Mr. Forrest sent for the picture, which his friend said was a carbon photograph transferred to the opal, and then glazed over and burnt in. When questioned further, the latter said it was a modification of Mr. Pouncy's process and Mr. Swan's, but he would not at present give fuller detail. Mr. Forrest had the idea that it was a carbon photograph; but an operative in the Potteries had asserted that carbon would not stand fire, but would all go off in carbonic-acid gas. It was, in point of fact, he believed, a photograph produced in ceramic colours, which was transferred to the opal glass, and therefore it stood the fire. [The lecture was illustrated with frequent experiments.]

Professor MOIR said,—The President has called on me to express an opinion on this paper, which, as a mere layman in the art of photography, I am hardly competent to do; but I think I may venture to express the opinion of the whole Meeting, when I say that it is their wish that the President should convey the thanks of the Meeting to Mr. Pouncy for the very instructive and interesting paper which he has now read. All who have practised or, like me, dabbled in the art of photography know the uncertainty and capriciousness of the printing-process, how sometimes a print on which you have bestowed great care fades, and another on which you have bestowed little care is found after all to be untouched. The general result is that we know nothing certain at this moment with regard to the printing-process by silver. At the same time, I suppose we may hold that we are now in the way of obtaining permanent silver prints; because I think the whole result of our experiments lately has been that with proper care you may secure tolerable permanency in our silver prints. But still it is an immense advantage to be enabled to fall back on a process which promises, and I suppose really performs, permanency. I do not know a more disagreeable thing than to go back and look at your old prints on which you have bestowed great care, and find that they have faded or are fading. But if we can get a process which secures permanency, and at the same time brilliancy of effect, I think that is one of the greatest boons to the photographic artist. But I should have cared very little for Mr. Pouncy's process had it merely given us permanency. I think no one who has seen his best pictures, or has witnessed his experiments to-night, can entertain the least doubt that, in addition to permanency, he also gives brilliancy of effect. Permanency is a relative term; and if Mr. Pouncy can secure as great permanency as printers' ink, I think none of us are likely to carry our views much further, and I believe his process in that respect is likely to realize all he has promised. He has shown us the application of his process in different ways; but, while I am not competent to speak upon them, I think he has thrown out very interesting hints, and a man of his energy and perseverance in the face of strong difficulties will, I have no doubt, work many of these things out to an efficient result. But in the meantime it is enough for us that he has shown us how to secure a reasonable amount of permanency, and given us prints to which no one can object, because in truth the best of them are quite equal to the silver process; I therefore move that a vote of thanks be conveyed to Mr. Pouncy through the Chairman.

Mr. **Kinnear** seconded the motion, and congratulated Mr. Pouncy on the great progress he had made, his pictures now being infinitely superior to those he had produced a few years ago; and indeed many of them were nearly as good, and some of them quite as good, as silver prints.

Sir **David Brewster** (addressing Mr. Pouncy) said,—I have much pleasure in conveying the thanks of the Meeting to you, for your valuable and instructive communication—one of the most important that has ever been submitted to this Society.

Mr. **Pouncy** returned thanks, remarking that, while he had not been at all times treated fairly by some societies, he never had had reason to complain of the Photographic Society of Scotland.

Mr. T. B. **Johnston** then exhibited and read the description of a new Camera (see p. 176), which had been kindly forwarded for the purpose by the Pantascopic Company of London.

The camera was accompanied by a series of panoramic views on the Thames, which were greatly admired; and the camera itself was examined with much interest by the members present.

On the motion of Professor Moir, a vote of thanks was given to Sir David Brewster for presiding.

Third Meeting

held in

The Society's Hall, 117 George Street,

January 10, 1865.

Mr. **Walker** in the Chair.

The Minutes of the preceding Meeting were read and approved.

Mr. **Thomas H. Douglas**, of St. Bride's, Morningside, was balloted for, and elected an ordinary Member.

Professor **Archer** then gave an address "On the Application of the Camera and Lantern to the Illustration of Popular Science,"—Mr. Samuel Highley, of London, having forwarded for explanation a series of his Photographic Slides.

Professor **Archer** said,—The object of the present lecture is to show the adaptability of the camera and the lantern combined to the illustration of popular lectures on various branches of natural science and of art also. A few evenings ago I had the pleasure of attending a Meeting of the Edinburgh Photographic Society in this room, and seeing myself for the first time the admirable effects which may be produced in this way. Upon that occasion we had simply natural-history subjects under our observation, and these were shown in the most beautiful manner possible.

I shall not only be able to show you some objects similar to those exhibited before the other Society, but I shall also be able to place before you various other branches of science by this mode of illustration, which those who prepared these slides think are amongst the best means of elucidating lectures on popular subjects that have yet been devised. Mr. Highley, of London, who has sent down these slides, is very sanguine that this will be a very important method of illustrating lectures; but he seems to have forgotten that, unless we have, independently of the lecturer, some exceedingly clever manipulators, the lantern and beautiful slides are of little use at all. Fortunately, however, in Edinburgh we have Mr. Slight and Mr. Nicol, who are not only competent to undertake this part of the duty, but are always willing to do so; and they will in the course of the lecture show you the slides projected on the screen in such a manner as, I am sure, will give universal satisfaction.

The first series of objects are microscopic. They are chiefly diatoms—those minute vegetable organisms which are found in almost every water, running or still, salt or fresh; and they are especially interesting to the microscopist from the fact that they produce siliceous frustules of extreme beauty; and, moreover, their history is very strange. Their power of reproduction is so wonderful that it has been computed by Mr. Edward Sang that in a hundred and seven days a certain species of *Navicula*, under certain circumstances, if allowed to go on increasing according to the ratio in which it is known to increase, would actually exceed the bulk of the whole earth. Of course they do not go on increasing in this way; and they can only go on increasing by drawing up from the earth the siliceous matter which goes to form the frustule.

Professor **Archer** then went on to exhibit the following slides, giving interesting particulars regarding each object presented to his audience.

Microscopic Objects.—1. Fragilaria virescens; 2. Coscinodiscus minor; 3. Arachnoidiscus Ehrenbergii; 4. Aulacodiscus Organensis; 5. Triceratium favus; 6. Amphitetras; 7. Surirella splendida; 8. Stellate tissue of Rush; 9. Gemmules of Sponge; 10. Spicula of Sponge; 11. Anchors of Synapta; 12. Acarus of Hedgehog; 13. Flea of Hedgehog; 14. Acarus of Flea of Hedgehog; 15. Parasite of Sparrow; 16. Telephorus griseus; 17. Thrips; 18. Fredericella sultana; 19. Laomedea gelatinosa; 20. Caryophyllea calycularis; 21. Alcyonium palmatum; 22. Pavonia lactuca; 23. Physalia utriculus; 24. Cyanea chrysura; 25. Rhizostoma Cuvieri; 26. Echinus mamillatus; 27. Asteria papposa; 28. Comatula rosea, 1st state; 29. Comatula, perfect; 30. Sand Star (Brittle Star), Ophiocoma minuta; 31. Loligo vulgaris; 32. Serpula contortuplicata; 33. Eolis coronata; 34. Dendronotis arborescens; 35. Flustra cornuta.

Mammalia.—36. Lion; 37. Lioness; 38. Tiger; 39. Zebra; 40. Rhinoceros; 41. Emeu.

Botanical.—42. Forest of Cocoa Palms; 43. Phytelephas (R. Magdalena).

Mineralogy.—44. Crystals of Uric Acid.

Fossil Restorations, &c.—45. Schistopleurum typus; 46. Ideal of Primitive World; 47. Tooth of Labyrinthodon.

Ethnology.—48. Japanese Girl at Work.

Physics.—49. Solar Spectrum with Frauenhofer's lines and fluorescent rays.

Astronomy.—50. Full Moon (De la Rue).

Topography.—51. La Mer de Glace; 52. L'Aiguille de Chamoz; 53. Ice-cave in Glacier; 54. Le Sommet du Buet à l'Aiguille; 55. Marine View (instantaneous); 56. Paris; 57. Rue Rivoli.

Views in Cornwall, &c.—101. The Pulpit Rock; 102. The Men in Armour; 103. The Tooth Rock, St. Mary's; 104. Pardenick Point; 105. Monk's Cowl; 106. Land's End; 107. Paris (the Louvre); 108. St. Etienne; 109. Bridge of River Tennessee; 110. Niagara; 111. American Locomotive with Cow-catcher.

Art.—58. Schnorr's Christ and Woman of Samaria; 59. Schnorr's Adam and Eve after the Fall; 60. Schnorr's Pharisee and Publican; 61. Kaulbach's Reynard the Fox; 62. Kaulbach's second Picture; 63. Kaulbach's King of Thule; 64. Koopmann's Christos; 65. Princess Alexandra; 66. Hogarth's March to Finchley; 67. Magni's Legatrice; 68. Foley's Ino and Bacchus; 69. Monti's Sleep of Sorrow and Dream of Joy; 70. Finis.

Referring to the art-illustrations, Professor **Archer** said,—We have often had lectures on art, and every one must be aware of the utter inability of any lecturer, however well acquainted with the subject, to make his audience feel the beauties of masterpieces which are hanging in galleries, and which they cannot actually see themselves; but if we can bring photographs from the galleries, so that the lecturer may not only give his opinion, but be able to show the points from which he derives his opinion, lectures on art would become much more interesting and valuable than they have been. A lecturer on biography, too, would be greatly aided by being able to exhibit accurate portraits of the characters upon whom he is lecturing. I have hurried over these subjects very hastily, because the large number of them rendered it necessary that I should give only a very few remarks indeed upon each; and as the subjects are very various, I must ask your excuse if I have been apparently careless over some of them.

The **Chairman**,—After the very lucid lecture which you have just heard, I need not trouble you with observations. I would simply propose that a cordial vote of thanks should be given to Professor Archer for the trouble he has taken in exhibiting these very beautiful specimens to you to-night. I would also propose that a vote of thanks should be given to Mr. Nicol and Mr. Slight for the able manner in which they have conducted the operations.

Messrs. **Helsby** & Co., of Liverpool, exhibited twelve specimens of their new patent enamel portraits, in morocco cases. The name given to this new process is that of Helio-aristotypia. It consists of a print taken from a negative, on polished enamelled glass, and having a similar disk of clear glass, bevelled at the edge, hermetically cemented over it, thus entirely excluding the air and securing permanency. The portraits can be preserved in cases, or mounted in brooches, lockets, or rings. They were greatly admired for their brilliant, soft appearance, being very superior to prints on albuminized paper.

Mr. **Tunny** exhibited two portraits on glass, very like to those produced by Messrs. Helsby. Mr. Tunny has been working in a similar direction for several years, and been very successful in his results.

The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors.

No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith.

The same proviso extends to communications to the Editor.

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THE PAST YEAR.

The year 1864 has been far more fruitful in important photographic discoveries than many of its predecessors. Of these, those directed towards the production of permanent and beautiful prints have been the most numerous. Early in the year Mr. Swan's new carbon process excited much attention; and at the April Meeting of the Society the inventor read an interesting and instructive paper on the subject, and exhibited some marvellous specimens of its results. Promising, as it did, absolute permanence, unfortunately the time and trouble required to produce the beautiful prints militated against its coming into general use; but we hope that the inventor will yet find means to remove all the difficulties that stand in the way of the universal adoption of the process. Permanence has been the mark at which all conscientious photographers have aimed; and it is impossible to conceive a process that would give more durable results than that in which carbon forms the image.

Another cause which interfered somewhat injuriously with the carbon process was the introduction into England, a few months ago, of a system of printing in which the salts of uranium played a prominent part, and which is now attracting a great deal of attention. It unfortunately happened that, through the injudicious management of the purchasers of the English patent, this process was introduced as one which *entirely* dispensed with salts of silver, and required no fixing with the exception of washing, an announcement which was received with the liveliest satisfaction by photographers, who have long wanted to do away with nitrate of silver and hyposulphite of soda; but when it was found, on analysis and by the publication of the specification, that, although nitrate of uranium was used in the preparation of the paper, the image was formed entirely of gold and silver, and that the use of a bath of sulphocyanide of ammonium was necessary to fix the impressions, public opinion underwent a violent and unreasonable change; and, we believe, the majority of photographers now look upon the process with suspicion. This is to be regretted: it might not justify the wonderful panegyrics heaped upon it by the 'Times' and, in a comically ignorant manner, by the 'Art-Journal;' but we feel convinced that a good and useful process will be the result of the many experiments that are now being made by skilful chemists and photographers on the Wöthlytype.

A new process of printing, which has not yet received the attention it deserves, has been discovered and described by Mr. Wharton Simpson. It consists in forming chloride of silver in collodion, which holds the salt in a very fine state of suspension or emulsion. Paper coated with this collodion is very sensitive, and gives rich and delicate prints, with a considerably less expenditure of silver than is required in the ordinary process.

Mr. Pouncy is still struggling with his printing-ink process, and, we believe, has made some progress; he has not advanced so far, however, as to justify us in the anticipation of any very perfect results. It is to be regretted that, by laying claim to all the credit of the invention of carbon printing, Mr. Pouncy has done much to prevent the recognition of the value of his really ingenious modifications. It is well known that the principles of the process were discovered and patented in 1855, by Poitevin; an improvement was made by Beauregard in 1857; and we heard nothing of Mr. Pouncy's process till 1858.

The curious old prints exhibited at the Society's meetings in the early part of the year have had very little more light thrown upon them than when they were first discovered: all we know on the subject is that they were produced by a process which might now be considered as a lost art.

No great improvement has been made in well-known processes. Dr. Hermann Vogel has made the valuable discovery that iodide of silver becomes less soluble, in a solution of nitrate of silver, at a high temperature than at a low one, which will account for many of the numerous pin-holes in negatives, that vex photographers in the hot days of summer. The ordinary silver printing processes have been improved in various details. Ammonia fuming and the addition of nitrate of soda to the bath, for the purpose of economizing the use of silver, have obtained with many operators. Some attention has been called to iron printing processes, but none of them with sufficiently perfect results to justify their commercial use. Some progress has been made in photo-engraving and photo-lithography; and several books—notably a reproduction of the first folio of Shakspeare—have been produced by these means.

In optical and mechanical science applied to photography but little advance has been made. The solar camera has received some alterations; and new names have been given in some instances to old lenses. The greatest novelty is probably the pantascopic camera, invented by Mr. Johnson, and which will take in an angle of any extent, traversing in fact the whole circle, but which practically is worked to take in about 120°. This ingenious camera will be very useful for the production of pictorial effects; but the truth of perspective is somewhat interfered with.

The commercial aspect of photography continues good. The enormous demand for card-portraits still continues, with perhaps a very slight decline. Copies of good paintings are in great demand; and a new style of portraiture, under the name of diamond cameo-portraits, seems likely to have a good run. Enlargements by the solar camera are also coming much into vogue.

The business success which has attended some photographers, and the mania which now exists for joint-stock speculations, have introduced two new companies to photography. One is entitled the "United Association of Photography (limited)," and was established to carry out any branch of photography in which profit might be secured. We glean from the prospectus that it will include photo-zincography, photo-lithography, and the cognate processes of photographic engraving; it has also made arrangements for the employment of artificial light when the natural light is insufficient, and to open portrait-establishments wherever an opening occurs. The other company was formed for carrying out the system of photo-sculpture in England, under the able superintendence of Mr. Claudet.

The light obtained by the combustion of magnesium wire has been used with very satisfactory results in portraiture. Its use in places where it is impossible to obtain daylight, such as the interior of caves, the pyramids, &c., will enrich the collector's portfolio with pictures otherwise impossible to obtain.

The usual exhibition of the Society was held in May. In many respects the most complete exposition of the results of the art that has yet been open to the public, a combination of adverse causes combined to prevent it having the pecuniary success it deserved, thereby entailing a severe loss to the Society. An exhibition of photographs in connexion with the Royal Cornwall Polytechnic Society was held at Falmouth; the Photographic Society of Scotland have an excellent exhibition now open; and photography is promised an honourable and satisfactory position in the International Exhibition to be held at Dublin during the coming summer.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A **Council Meeting** was held, December 21st, at 12 York Place, Portman Square; James Glaisher, Esq., F.R.S., in the Chair. The minutes of the last Meeting having been read and confirmed, the following members and subscribers were proposed and elected:—

Lord Otho Fitzgerald; J. Gurney, Esq.; J. Middleton, Esq., Jun.; H. T. Butler, Esq.; Mrs. R. Malcomson; Mrs. Sankey; W. Eames, Esq.; Mrs. Skinner; J. Carter, Esq.; Mrs. Le Marchant Thomas; R. W. Comley, Esq.; A. A. H. Currie, Esq.; Capt. C. M. Layton; Mrs. E. Forbes; H.G. Astell, Esq.; W. Adamson, Esq.; Mrs. S. G. Adams; J. Taylor, Esq.; Miss Murphy; G. C. Wallich, Esq.; A. Wright, Esq.; R. S. K. Shand, Esq.; W. H. Pepys, Esq.

The Secretary then laid before the Meeting the following prizes which had been awarded at the previous Meeting:—

A Silver Goblet to E. R. Hall, Esq.

A Silver Goblet to Capt. Mason.

A Silver Goblet to G. Bevington, Esq.

An elegantly chased Fruit-basket to W. D. Hemphill, Esq., M.D.

A handsome Claret Jug to J. W. Rimington, Esq.

A large handsomely bound Album to W. D. Howard, Esq.

A large and very handsome silver-mounted Portrait-album to C. A. D. Halford, Esq.

Ditto to Capt. M. Hutton.

A small one to F. H. Lloyd, Esq.

The Secretary stated that all the prizes were obtained on the most favourable terms possible, and always more or less exceeded the amount awarded.

The Council expressed themselves much pleased with them; and a vote of thanks was passed to the Secretary for the time and attention he had devoted to the matter.

Lieut.-Col. the Hon. D. F. De Ros proposed, and it was decided by the Meeting, that the contemplated exhibition of the Society's pictures should be postponed until February, in the hope that it might better suit the convenience of the President and Council.

The proceedings then terminated.

A. J. Melhuish, *Hon. Sec.*

On the Photographic Representation of Preparations by Injection and Imbibition, and of Preparations of Blood-corpuscles in their natural colours. By Professor Gerlach, of Erlangen.

[Read before the Royal Academy of Sciences of Berlin, 17th October, 1864.]

Photographers have long been occupied with experiments for the purpose of discovering, in place of the hitherto generally employed method of printing with chloride of silver, a process which should give an absolute guarantee for the permanence of the pictures, this, as is well known, not being attained in printing with chloride of silver. But it is only very recently that these experiments have led to results which we must regard as furnishing the solution of the problem of preparing absolutely permanent copies, yielding nothing in fineness of definition to the pictures obtained with chloride of silver. Mr. J. W. Swan has improved the well-known and often-tried copying-process with chromates, gelatine, and carbon, by employing as the immediate support for these substances, a layer of collodion instead of paper, and thus enabling the deepest spots of the layer of gelatine and chromate bearing the carbon to be first reached by the light; so that there can hardly be any doubt that the method of copying which is founded upon the action of light upon chromates will have much influence on the future of photography. Indeed the only reason why chromo-prints have hitherto been undervalued, namely the absence of half-tones, is completely removed by Swan's process.

Swan's process was first made known to me by his communication in the 'Photographische Archiv' for May 1864 *. As a pigment, he employed carbon in the form of finely ground indian ink; but he remarks that, for the purpose of altering the tint of the prints, other colouring-matters, such as indigo or carmine, might be added to the indian ink. The latter statement led me to think of making experiments with those colouring-matters which are used in microscopic investigations for the production of preparations by injection or imbibition. I first tried the carminate of ammonia, which I brought into use in microscopic preparations, this being the colouring-material with which the most beautiful preparations have been made both by injection and by imbibition. Even in my first experiments, I was rejoiced to see that the new process permits the employment not only of granular colouring-matters, such as water-colours, but also of perfectly diffused materials, amongst which carminate of ammonia is to be reckoned. With this colouring-matter I succeeded at once in producing representations of preparations so perfect that the observer could scarcely detect any difference between the preparation itself lying in the field of the microscope, and its photographic picture. Photography guaranteed the absolute truth to nature of the figure, and the colour of the picture was produced by the same colouring-matter which served for the production of the preparation. In this way it was certainly possible to obtain the most perfect pictorial representations of natural objects—that is to say, absolute conformity in colour and outline between the object and its picture.

Encouraged by the result obtained with carminate of ammonia, I at once commenced experiments with the blue colours employed in microscopic preparations, namely, prussian blue and indigo-carmine, or indigo-sulphite of potash. Prussian blue is employed for the preparation of injections of lymphatics and the efferent ducts of glands, for which carminate of ammonia is not so well suited; indigo-carmine, on the contrary, is used for blue imbibition-preparations. Both these colouring-matters are, however, quite unsuited for the production of coloured chromotypes. Prussian blue gives impressions of a dark, dingy blue colour; and the solution of indigo-carmine loses its blue colour entirely on the addition of a solution of bichromate of ammonia, the indigo being deprived of its colour by the great amount of oxygen of the double chromate. I now resorted to the aniline colours, and obtained excellent results with aniline blue. The alcoholic solution of this colour occurring in commerce was diluted with ten times its quantity of water, and added to the solution of gelatine containing the bichromate of ammonia. The copies produced with this mixture exhibited the closest agreement in colour with the injections and imbibition-preparations in the production of which prussian blue and indigo-carmine had been employed.

I then tried animal colouring-matters, and, in the first place, the colouring-matter of the blood, for the representation of coloured blood-corpuscles. Simply coagulated blood could not be employed, as the albuminous bodies are thrown down by chromic acid. I therefore exposed coagulated blood to a boiling heat, removed the water of the coagulum as much as possible by pressure between thick linen, and then triturated it, with the addition of a little water, in a mortar. The fluid thus obtained was filtered through a thin linen rag, and the filtrate was employed for the representation of the coloured blood-corpuscles. Of course a solution of the colouring-matter of the blood could not be obtained, and hence there was an unmistakeable granular appearance in the figures of the blood-corpuscles of Man and of the Frog, prepared by me with pig's blood; but I have scarcely any doubt that, by very careful trituration of the coagulum in the mortar and by the employment of finer filters, perfectly satisfactory results may be obtained.

I have hitherto made no experiments with other animal colouring-matters, as, for example, with that of the bile, for the representation of the undigested muscular fibres, coloured with bile, which occur in the fæcal matters.

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* Photogr. Archiv, Band v. p. 255.

New method of Photography.

By Dr. H. Schwarz.

The proposal has already been made to use in photography, at any rate for positives, the reaction of oxalate of sesquioxide of iron, it decomposing in sunlight into oxalate of protoxide of iron (insoluble) and carbonic acid. Paper impregnated with sesquioxalate of iron is, after exposure, to be washed, by which the protoxalate formed remains in the fibres, while all unchanged sesquioxide is washed out. The picture is made visible with a blue colour by pouring solution of red prussiate of potass over it, or brown, by permanganate of potass. The author has found that it is simpler to use a mixture of neutral sesquichloride of iron, oxalate of ammonia, and red prussiate of potass, weighed in the equivalent proportions $3Fe_2Cl_3$, $9NH_4OC_2O_3$, and $2Cfy_2K_2$, and dissolved in water. This mixture, prepared in the dark, exhibits a green colour without the least trace of blue; but when exposed to the light, the oxalic acid exerts a reducing action, protoxide of iron is formed, and this gives, with red prussiate of potass, Turnbull's blue, which is uncommonly permanent. Paper thus impregnated, placed while moist under a collodion negative and exposed to the sun, gave, after a short time, in the places corresponding to the lights of the negative, a beautiful dark blue. After washing with pure water, the resultant picture was quite permanent. In diffused light, too, of course after a longer time, true copies were obtained. Much other occupation has prevented the author from pursuing the subject further. He leaves the idea to photographers to follow out.—*Breslauer Gewerbeblatt*, 1863, No. 20.

REVIEW.

Views of Switzerland and Savoy. New Series. Photographed by W. England.

This beautiful series of views for the stereoscope, which are dedicated, by permission, to the Alpine Club, embrace some of the finest pictures it has ever been our good fortune to examine. They convey to the beholder a reality which cannot be surpassed. Mr. England well deserves the thanks of the public for thus enabling them to bring into their own homes these truthful delineations. The photographic execution of them marks the great experience of the artist.

A Hint to Portrait-Photographers.

A friend, writing from Naples, says:—"You may think yourself lucky in not being a portrait-photographer. Miss Lejeune is driven almost mad by people moving after they have been *posed*. She has lately been obliged to post up a notice, that if the sitters move and spoil the photograph, they will be obliged to make another 'rendezvous,' and pay a second deposit, the first being forfeited. This will make sitters a little more careful, as they will have to wait a fortnight, besides losing their money."

CORRESPONDENCE.

F.S.A.—It is exceedingly difficult to copy an oil painting such as you describe, by means of photography. The yellow varnish which covers the majority of old paintings renders a very long exposure needful. The collection named as successful are not truly copies of the original pictures; we are informed that a negative was taken of the required size, and, on an imperfect positive, the pictures were worked out in detail with suitable colours by an artist; from these drawings other negatives were taken, giving the good effect which you find so much trouble in producing. The painting should be placed in the strongest light, the upper part leaning a little forward. Dry plates may be advantageously used, taking care to give even *more* than the average difference of time between dry and wet collodion.

H. G.—Various lamps are used for the burning of the magnesium wire; one exhibited by Mr. Hart before the Society answers the purpose well. Mr. Solomon, of Red Lion Square, has them of various constructions.

A. R.—There are many photographic artists in London who especially devote their attention to enlarging photographs to life-size; an amateur will do well to trust to a professional, the apparatus for successful results being expensive and bulky. At a recent Meeting both Mr. Dallmeyer and Mr. Aldis exhibited some specimens with all the accuracy of definition required, and more than four feet in length.

"*Fading.*"—We cannot inform you of any chemical means by which you can detect if hyposulphite of soda remains in small quantities in the prints; the taste will often indicate that a print has not been sufficiently washed, when it would be supposed to have received sufficient care in that respect.

A Member.—The subscription terminates on the last day of the present month.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

No. 154. FEBRUARY 15, 1865.

PHOTOGRAPHIC SOCIETY.

The next Ordinary Meeting of the Society will take place at King's College on Tuesday, March 14th, at eight o'clock, when a Paper will be read by Mr. Cooper, Jun., in continuation of his former communication on "Printing with the Salts of Uranium." Mr. G. Wharton Simpson will also read a Paper describing "A Process of Printing in which Chloride of Silver is used in Collodion."

Members may now obtain the photograph of "Bringing Home the May," on application to Mr. Mattress, at Messrs. Taylor & Francis's, Red Lion Court, Fleet Street.

Meetings of the Society, 1865.

1865. Tuesday,	March	14
„	April	11
„	May	9
„	June	13

It has been determined that the future Meetings of the Society shall take place on the second instead of the first Tuesday in each month. This decision has been come to chiefly that the report of our own, as well as the proceedings of the Photographic Society of Scotland, should appear as soon after the respective Meetings as possible. The day of publication of the Journal will remain the same, excepting when the second Tuesday shall occur, as it does in the month of March next, on the 14th. When this is the case, the publication will be delayed until the following morning, the 16th; consequently our next issue will take place on Thursday, the 16th of March. With the present number is issued, the title and index of the 9th volume; and in future a volume will comprise a year's transactions.

PHOTOGRAPHIC SOCIETY OF LONDON.

Annual General Meeting.

King's College, London.

Tuesday, February 7, 1865.

The Lord Chief Baron, F.R.S., in the Chair.

The Secretary read the Minutes of the last Meeting, which were confirmed.

The following gentlemen were elected, by ballot, Members of the Society:—

Thomas Greenish, Esq., New Street, Dorset Square.

Frederick Hollyer, Esq., Sunning Lodge, Bartholomew Villas, Kentish Town.

J. B. Nicholas, Esq., Madras.

Dr. Wright read the Annual Report of the Society, as follows:—

In accordance with annual custom, the Council of the Photographic Society of London have to render the annual account of their stewardship, to report on the progress of the Society, and submit a balance-sheet of the receipts and expenditure during the past year.

In preparing the Report now submitted, the Council have considered it advisable to depart somewhat from the precedent of former years: they desire to direct attention to the future prospects of the Society, as well as to notice its past progress.

The Photographic Society of London has been established eleven years, and the Council look back with satisfaction to the beneficial influence it has exercised on the progress of photographic art during that period. The increase in the numbers of those engaged in pursuits connected with photography has, during the last few years, been astonishingly rapid: in this country alone they form so large an aggregate body as far to exceed in numbers the whole population of many an important state. It is the ambition of the Photographic Society of London to represent this great community, advocating the interests and assisting the labours of all,—working in harmony with other existing societies, but also keeping in view those causes of failure which have led to the breaking up of several promising photographic societies. Institutions, like individuals, can only achieve and maintain success by giving heed to the lessons of experience; and the suggestions which your Council now submit for adoption by the Members have resulted from a careful investigation into the present condition of the Society, with the view of improving its position, and extending its usefulness.

It will be seen, on reference to the balance-sheet, that the Society is free from debt. But the financial statement of the past year shows that the expenditure exceeded the receipts by a sum of £66 4*s*. 10*d*.

The income (comprising subscriptions, £300 6*s*.; profits of Journal, £23 19*s*. 8*d*.) amounted to £324 5*s*. 8*d*. The expenditure (including salaries, cost of Meetings, and incidental expenses, £267 16*s*. 2*d*.; loss on Exhibition, £119 12*s*. 4*d*.) amounted to £387 8*s*. 6*d*. The debts now owing to the Society may be estimated at £199 8*s*. 3*d*.

In the last four years of the Society's existence there has been very slight variation in the amounts of annual income or the *ordinary* disbursements.

	Receipts. Income.			Expenditure. Ordinary expenses.		
	£	*s*.	*d*.	£	*s*.	*d*.
1861......	333	17	10	313	19	7
1862......	362	2	2	299	3	10
1863......	331	4	2	295	10	8
1864......	324	5	8	267	16	2
	£1351	9	10	£1176	10	3

In the *total* expenses of the Society there was, in

	£	*s*.	*d*.
1861 a surplus of	0	1	3
1862 a surplus of	32	18	10
1863 a deficit of..........	166	3	2
1864 a deficit of..........	66	4	10

making an excess of expenditure over income of £209 7*s*. 11*d*.

The explanation of this is to be found in the losses incurred by the Exhibitions. It will be seen that the mere working expenses have been £1176 10*s*. 3*d*. during three years, whilst the receipts have been £1351 9*s* 10*d*.

	£	*s*.	*d*.
In 1861 the cost of Exhibitions was	326	10	7
1863 ,, ,,	308	15	8
1864 ,, ,,	173	5	4
The receipts were—			
1861	363	5	0
1863	115	19	0
1864	53	13	0

the total deficiency in this one item on the three years when Exhibitions have been held being £275 14*s*. 7*d*,—the relative position of the Society, in comparison with the former year, being that at the commencement of 1864 our liabilities were £234 13*s*., with £470 8*s*. to meet them, whilst at the present time the liability is £233 18*s*. 8*d*., with the sum of £413 14*s*. 6*d*. to meet it.

The serious loss entailed by the annual Exhibitions has led the Council to consider that the time is now arrived when some change is imperatively required. It appears to be generally conceded that no Exhibition of photographs can now be undertaken without loss, if conducted on the scale of former years. But it is still eminently desirable that the friends of the Society should meet together, and that an opportunity be afforded of estimating the progress of the art. It has been suggested to diminish the time during which the Exhibition is open, so as to save the heavy cost of rental, and to inaugurate the opening by a *soirée* to the Members and their friends, when the adjudication of the Medals shall be announced, and special prominence given to the great discoveries of the year.

The proceedings at the Meetings of the Society have been considered by your Council under the belief that it is especially important to cultivate that interchange of knowledge which is essential for solid advancement, so that scientific or theoretical investigators may obtain the assistance of ripe practical experience. This useful corrective process is one of the elements it is most advisable to cultivate at the Meetings of the Society. It is important that the papers read be of immediate interest; but it is of nearly equal importance that the discussions they elicit should be free and full, so that those who refer to the reports for information should have many opinions to guide their judgments. The Council have specially directed attention to the obtaining a succession of practical papers for the ensuing Meetings. In this they must appeal to the Members generally for cooperation; and the Council would especially point out how direct and valuable an opportunity these Meetings afford of bringing before the photographic world the results of individual research. All communications forwarded will be impartially considered by the Council, and every facility afforded for illustrating or explaining the views of the authors.

At the Meetings of the past Session a large number of specimens, illustrating new processes or other matters of photographic interest, have been shown or described, for which the Council desire to express their thanks to the exhibitors. In the belief that those contributions greatly enhance the interest of the meetings, it is the wish of the Council that all such illustrations of the art shall receive due attention, and none be passed over without some official notice. With this view it has been decided that information must be given, prior to the meeting, of whatever is intended to be laid before the Members.

The proposed alteration in the days of the monthly meetings has been decided on after much careful deliberation. The two national Societies which represent photography in England and Scotland have their proceedings specially reported in the Journal. It is advisable that these reports appear at the very earliest date after the meetings; but certain cogent business reasons rendered it expedient that the Journal should continue to be published in the middle of the month, and on a stated day. The proposed change in the days of the meetings, henceforth to be held on the second Tuesday in each month, will allow authentic reports of both the above-mentioned Societies to appear within a few days after the Meetings.

The management of the Journal has engaged the attention of a Committee specially appointed to consider that subject. It is hoped during the ensuing year to make such alterations and improvements that the 'Photographic Journal' shall be received as a reliable exponent of whatever is valuable in reference to the photographic art.

The Council recognize with pride the cooperation of ladies in photographic work. The walls of the Exhibitions have borne evidence of the excellent practical results produced by them. And the Council feel assured that the early death of a noble and gifted lady, a Member of the Society, whose photographic skill was only one of many bright accomplishments, will be deeply regretted by all who saw the exquisite photographic pictures exhibited by the late Lady Hawarden.

In introducing the name of the newly elected Vice-President, the Council would refer to the number of photographers of eminence among the ranks of the medical profession. Many of them, like Dr. Wright, have been chiefly led to the study of the art through a recognition of its value in exactly delineating disease, without that irksome length of time required for a sketch even approximately accurate. The names of Dr. Diamond, of Dr. Arthur Farre, of Dr. Julius Dolfuss, of Dr. W. Budd of Bristol, of Professor Beale of King's College, deserve especial mention. And the beautiful microphotographs of Dr. Maddox and of Dr. Duchesne testify the importance of photography in demonstrating with unimpeachable accuracy the appearances of minute structure as revealed by the microscope. The time is probably not far distant when physiology will depend on photography for reliable illustrations of the subjects on which it treats.

The newly elected Members of Council are Major Gresley, Mr. Mayall, and Mr. Shadbolt, all of them photographers of such eminence that the mention of their names will ensure immediate recognition of the reasons for their nomination.

During the past session the following papers have been read:—

Mr. HENRY COOPER, jun. on the Application of Double Printing.

Mr. HANBURY, on a Convenient Washing-Apparatus.

Mr. SWAN, on a New Method of Carbon Printing.

Mr. HENNAH, of Brighton, on Positive Printing.

Mr. SYDNEY SMYTH exhibited the Application of the Magnesium Light.

Mr. HENRY COOPER, Jun., on Printing with the Salts of Uranium.

Mr. HUGHES's valuable communication on the Tannin Process.

Dr. MADDOX on Photomicrography, illustrated by some of the more remarkable specimens by Mr. How, by means of the Magic Lantern.

Mr. HAES on Zoological Photography, illustrated by a series of Pictures.

Mr. JOHNSON also exhibited and explained the New Pantascopic Camera.

On the motion of the Chairman, the Report was adopted and confirmed.

Mr. ELPHINSTONE UNDERWOOD said, he had great pleasure in proposing that the day of Meeting be changed from the first Tuesday to the second Tuesday in each month. The Council of the Society were anxious to do all in their power to promote its objects, and they asked the cooperation of the Members to make the monthly Meetings as interesting as possible. It appeared to be a most desirable object that the reports of the Society should be published, as far as practicable, immediately after the Meetings; and that was the special reason why the Council recommended the alteration now proposed.

Mr. SPODE seconded the motion.

The CHAIRMAN observed that, with reference to the day of Meeting, it was obvious that the first Tuesday in January, which possibly might be New-Year's day or a few days afterwards, could scarcely be so convenient as the second Tuesday in that month. So, he would say, for February or any other early month in the year, as far as he was personally concerned, he would rather have the second Tuesday than the first. With respect to the other periods of the year, there was no very great inconvenience except that arising out of the publication of the Journal. Those Members who had attended to the

Report (which he had no doubt they all did), would observe that the object of the change of the day was to make the publication of the minutes of their proceedings more convenient, and to enable them to be placed more speedily before the public after the Meetings of the Society.

The motion was put and carried *nem. con.*

The **Chairman** called attention to some extremely beautiful specimens of Helsby's Helio-aristotypia, which had been placed upon the table.

Dr. **Diamond** read the following letter from Dr. Hermann Vogel, President of the Photographic Society of Berlin:—

Berlin, January 27, 1865.

Sir,—The Berlin Photographic Society intends to arrange an International Exhibition for the beginning of next May.

Ordered by the Society, I make free to beg the most universal frequentation of the Exhibition by the honourable Members of the London Photographic Society.

The Exhibition Committee will not fail to give the English photographs exhibited a place corresponding to the high rank of English photography; and begs to observe that the Exhibition is worth the general notice of the English photographers and amateurs, the English photographs being highly esteemed in Germany, and becoming an important article of import into that country.

I have added to my letter several copies of the programma of the Exhibition, which I beg you to distribute among the Members of the London Photographic Society, and to publish in the Society's Journal.

Mr. Trübner, 20 St. Dunstan's Hill, London, has engaged to convey the articles delivered to him for the Exhibition.

Recommending the Exhibition to the honourable Members of the London Photographic Society, I have the honour to sign,

Yours faithfully,
Dr. **Hermann Vogel**,
President of the Photographic
Society of Berlin.

Berlin University, January 28, 1865.

Programma of the Berlin International Photographic Exhibition of 1865, *arranged by the Photographic Society of Berlin.*

1. The Berlin Photographic Society intends to arrange an International Photographic Exhibition, which is to begin the 15th of May, and to last previously the next four weeks after that term.

2. The Exhibition shall bring all branches of photography, i. e. portraits, groups, landscapes, architecture, reproductions, enlarged and microscopical photographs, instantaneous views, photographs of animals and plants, &c., &c.; besides it shall show the many applications of photography to art, science, and industry: in the first line, photolithographs, photographical engravings, photosculptures, photographs on china, glass, and enamel, patterns of the application of photography to war, architecture, and engineering (i. e. pictures of engines, ships, &c.), on natural science, medicine, justice, commerce, mechanics, &c. &c.

Furthermore the Exhibition shall give a tableau of the History of Photography, and for that purpose patterns shall be exhibited, which illustrate the processes used since the origin of our art, and the gradual improvement of them. The Committee begs possessors of such patterns of historical value to send them to be exposed; likewise it wishes to have exhibited proofs of the newest methods, as carbon-prints, uranium-prints, pictures on dry plates, &c. Other objects for the Exhibition are photographic apparatus, chemicals, frames, furniture for the studio, and photographic literature.

3. Notice of articles to be exhibited is to be sent in, post paid, before April 1, 1865, with specification of the nature and number of objects, and the breadth and height of room claimed for them, to Mr. Ferdinand Beyrich, 101 Friedrichsstrasse, Berlin, who will give further information on post-paid appliance.

4. The articles themselves must be sent in before May 1, 1865. Objects arriving after this time cannot be taken notice of. Send the articles also to Mr. Beyrich. For the compilation of the Exhibition Catalogue, a special list of contents is to be added to every article sent in, containing all explanation the exhibitor might wish to have published by the Catalogue; if the articles are to be sold, the price of them, &c.

5. The photographs to be exhibited are to be exposed in frame under glass-panes. The framing of the photographs may, if requested, be provided by the Committee at the charge of the exhibitor. Photographs of exceedingly great dimensions may, if requested by the Exhibitor, be exposed without a covering pane.

6. The returning of the articles cannot be done sooner than two weeks after the Exhibition is closed.

7. The expenses for sending in and returning articles are paid by the exhibitors. To facilitate the conveyance, agents employed in the capitals of Europe may be applied to.

For the United Kingdom, Mr. Trübner, St. Dunstan's Hill, London, has engaged himself as agent for conveying the articles delivered to him.

Of course, exhibitors may send their articles directly to Mr. Beyrich.

8. Fire-insurance is provided by the Committee; but although all possible measures will be taken to protect the articles against theft or other injuries, the Committee cannot answer for such damages.

9. The Exhibition Committee claims the right of excluding from the Exhibition articles of no value, or not corresponding to the statements of this programma.

10. The Committee is trying to procure exemption from custom. Further information thereof will be given as soon as the exemption is granted.

Mr. Thurston Thompson exhibited an extensive series of beautiful photographs taken from pictures and other works of art. Mr. Joubert laid on the table specimens of photographs done by his new process, and promised a short description thereof at a future meeting.

Messrs. Helsby exhibited some fine examples of photography on opal glass.

The Chairman said that, this being the Annual Meeting of the Society, the election of Officers would, according to the Rules, now take place. By those Rules it was provided, that whoever proposed to change what he might call (for every one would understand him) *the house list* must give notice of his intention; but whether the satisfaction which was entertained with respect to the names which he would now read to the Meeting was so great that no one desired a change, or from whatever cause it might arise, it seemed that there would be no necessity on this occasion to appoint scrutineers, or to have a ballot, or to go through any of the forms of election, because no other names could be now proposed except those which he had in the paper before him. The only course for him therefore was declare those gentlemen duly elected who had been put forward by the Council.

President.

The Lord Chief Baron, F.R.S.

Vice-President.

H. G. Wright, Esq., M.D.

Treasurer.

A. R. Hamilton, Esq.

Council.

Major Gresley.
Mr. Mayall.
Mr. Shadbolt.
Mr. Thurston Thompson.
Mr. Robinson.

The Secretary then laid the Balance-sheet on the Table.

PHOTOGRAPHIC SOCIETY.

Dr. Income and Expenditure Account. *Cr.*

Dec. 31, 1864.	£	s.	d.	Dec. 31, 1864.	£	s.	d.
To Entrance Fees and Subscriptions	297	8	0	By General Expenses	267	16	2
Interest Account	2	18	0	Exhibition Account	119	12	4
Photographic Journal	23	19	8	Property Account	3	2	0
	324	5	8				
Capital Account per Balance	66	4	10				
	£390	10	6		£390	10	6

Dr. General Balance, Dec. 31, 1864. *Cr.*

Dec. 31, 1864.	£	s.	d.
To sundry persons for Balances owing to them	233	13	8
To Capital Account for Balance	398	15	9
	£632	9	5

Dec. 31, 1864.	£	s.	d.	£	s.	d.
By sundry persons for Balances owing by them				99	8	3
For Subscriptions in arrear—say				100	0	0
By Cash Account:—Balance at Bank	96	17	8			
Petty Cash	25	10	7			
Interest Account	2	18	0			
				125	6	3
By Three per Cent. Consols., Balance of Stock				100	18	4
By Property Account per Estimated Value				27	18	0
By Photographic Journal per Value of Stock				178	18	7
				£632	9	5

We have examined the Accounts, and find the same correct.

Feb. 7, 1865.

CHARLES HEISCH, } *Auditors.*
HENRY CLAUDET, }

The PRESIDENT then delivered the following Address:—

GENTLEMEN,

I have to return you thanks for the honour you have conferred upon me on this occasion, by sanctioning the nomination of myself as President by the Council. Gentlemen, I entertain the same zeal for the progress of photography that I ever did, whether it is considered as an art or as a science; and though I am not so young as to be able to testify that zeal in the same way that I have done formerly, I hope I am not altogether incapable of rendering some service when the opportunity arises. The expenses of our meetings here are justly considered by the Council as not open to any exception; but it is possible, very likely, to procure accommodation upon easier terms elsewhere. It is notorious that societies which undoubtedly (as I think) have no higher claim to the assistance of the Government are accommodated in the public rooms at Burlington House. There almost every society of any note (except the Society of Antiquaries, which has declined to go from Somerset House) has some accommodation. The expense of coming to this place, I am told, is about £40 per annum; and I think it very likely we may be able to get accommodation at Burlington House. I propose, myself, to go there to-morrow and ascertain if it be practicable in point of fact, and, if practicable in fact, then I propose to make application to the members of the Government with whom the matter rests, so as to endeavour to obtain the sanction of the authorities of the country for our holding our meetings where other societies (some of which, undoubtedly, are not better entitled to favour and protection than we are) are now accommodated.

Gentlemen, on the earliest occasion when I had the honour to address you, I stated—not at all undervaluing the beauty, the accuracy, and the important uses which in all directions arise out of the exercise of the photographic art (uses which are daily becoming more important, more universal, and more generally felt)—not undervaluing this exercise, of which you have abundant specimens upon the table, I stated that I thought great assistance might be derived to philosophy by considering that part of photography which is purely scientific. And there is no doubt that the labours of photographers have contributed very largely to that dissection of the sun's rays which enables us to discover and detect what are probably the structure, and character, and properties of the great luminary which is the head and front of the photographic art—I mean, the sun itself. The labours of Mr. Warren De la Rue in this department you must all of you be aware of; and I may put within a parenthesis that I hope, as soon as ever the weather becomes warmer and more fit for such an exhibition, we shall be able to induce Mr. Warren De la Rue to perform a promise given by him to deliver a lecture upon the subject in this room, or in some better one, if we get it. It is perfectly well known that when you dissect and separate by means of a prism the rays of the sun, you get at the extreme end, where the red rays are, rays which are not visible, at least not to our eyes, but which apparently contain the heat; and at the other end, where the violet rays are, you get the actinic rays, which are the source of the photographic power, but which are not visible to our eyes. They produce light and shade, and sometimes by accident, apparently, they produce colour; but they are invisible to the human eye. It very likely may be that there are creatures to whom these rays are as visible as those we see, it being perfectly well known that at certain periods of life the human ear becomes insensible to the sound of the cricket, or the extremely shrill note of the bat; and as we find that there are sounds audible to some ears which are not so to others, it naturally leads to the conclusion that if there are certain parts of the sun's rays which are invisible to some eyes, they may be visible to others, and may be performing operations upon the senses of other creatures to which we are not open. But what I was about to remark was the extraordinary effect of the diligence and zeal, and the powerful battery (if I may so call it) of apparatus which Mr. De la Rue has brought into the field, for the purpose of discovering the structure of the sun. And it is now apparently well known that the sun is probably more unequal in its surface than the moon is, and that by proper arrangements of apparatus you can discover these inequalities. It was first discovered, I believe (after astonishing the philosophical world for some time, no one being able correctly to understand what it meant), during an eclipse of the sun, when the eye is enabled to see that which is otherwise concealed. It was then ascertained that there were extensions upon the surface of the sun, the effect of which no one could judge of at that time, but which now turn out to be undoubtedly projections in the nature of mountains. And Mr. De la Rue (as this is purely a photographic discovery) has been enabled by photography to obtain pictures of that which the human eye cannot see, but which the eye of photography does see. In other words, the rays which produce no effect upon the human eye will pass through the excessive light which covers the surface of the sun, and make an impress upon a proper paper so as to give you a picture of the sun when shining in his full strength. This is one of the matters which, I own, I have been watching for and expecting; but I expect much more. I own that I look forward to the period when photography and its connexion with the arts and chemistry will be the means of discovering a variety of matters which at present are either in a state of great obscurity or else almost entirely unknown.

Gentlemen, I am sorry that my voice is, at this present foggy season, not in a condition to enable me to express myself with much satisfaction; but I am glad to have had the opportunity of making these observations. Thanking you for the honour you have done me, and professing to be ready to render you all the service in my power, I would only add that I shall be happy to continue to fill the office to which you have elected me this evening, as long as you think I am available for any purpose; and when I cease to be your President, I shall not cease to be your warmest well-wisher, and, as far as I have any power, a zealous promoter of the objects of this Society.

The proceedings were then adjourned to the second Tuesday in the month of March.

The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the Ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors.

No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of his good faith. The same proviso extends to communications to the Editor.

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Exhibition of the Photographic Society of Scotland and its Medals.

The Ninth Annual Exhibition of the Photographic Society of Scotland is one of the very best, if not the best, exposition of the art that has taken place under the auspices of this Society. It is true, there is no great centre of attraction—no picture that would command the attention of the crowd, the ignorant as well as the learned in the art—as in former years; but the whole is uniformly excellent, qualified, fortunately (for we do not quite like this evenness of result—it is too monotonous) by some poor and a few very bad pictures.

As in nearly all collections of photographs, manipulation triumphs over mind. About twenty of the pictures exhibited are the result of intellect; about 600 result from the careful use of lenses, cameras, and chemicals; and the remaining few have certainly not benefited by either. Photographs are now becoming so uniformly good that perfect manipulation will pass unnoticed, if it be not recommended by some more brilliant qualities.

This plethora of excellence is, we presume, the explanation of the greater number of medals given this season. Early last year the Society advertised that they proposed to award their silver Medals for the following pictures in their ensuing Exhibition:—

The best view taken by a dry process; the details of the process to be communicated to the Society.

The best view, taken by an amateur, by any process.

The best view in Scotland, taken by any process.

The best group.

The best portrait.

The Council reserving the power of awarding extra Medals for any picture of sufficient merit which may not have been included in the above list.

It will be seen, from the last clause, that sufficient margin was allowed to the adjudicators to reward any specially worthy production; but it is to be regretted that the prize pictures were confined to those printed from single negatives, the only deviation from this rule being that views might have had skies printed from separate negatives, or they might have been toned or shaded before fixing. This alteration of the rules has evidently had an effect on one, at least, of the most regular and successful exhibitors, who this year sends only comparatively small pictures instead of the large and important works he has formerly exhibited.

The Medals have been awarded as follows:—

For the best landscape by a dry process, to Mr. James Mudd, Manchester, for his view in "Dunham Park, Cheshire"; the negative taken on a collodio-albumen plate. This is a splendid study of trees and water, and a beautiful transcript of park-like scenery. Mr. Mudd has long maintained his position at the head of the dry-plate photographers in England. This is the second Medal this artist has received from the Scottish Society.

The Medal for the best view by an amateur was awarded to Mr. John Smith, for his picture "On the Leader-water, Melrose," a charmingly artistic little picture, in which composition, light and shade, and all art-qualities have received attention.

Mr. James Annan, of Glasgow, obtained the

Medal awarded for the best view in Scotland, for his picture of "Dumbarton Castle." Mr. Annan is always happy in his landscapes, and the prize picture fully bears out the high opinion we have always entertained of his merits, not only as a successful landscape-photographer, but also as a master of portrait-photography and reproduction.

To Mr. J. Ramsay L'Amy was awarded the Medal for the best group, a clearly defined and well-lighted picture of "A Group"—a capital rendering of a difficult subject.

Mr. H. P. Robinson (Leamington[*]) received the Medal for the best portrait. The subject obtaining the reward is catalogued "Brenda," the name, we presume, of the pretty girl portrayed. It has been one of the reproaches of photography, often seized upon by its detractors, that the undiscriminating lens and the insensate though sensitive tablet regarded not the distinction between golden locks and tresses which vie with the raven's wing in jetty blackness, rendering each with the same metallic lights and sombre shadows. Here, at least, the reproach is groundless. A fair and gentle girl is reading in an attitude of perfect repose, all unconscious of portraiture, her sunny locks flowing in waving luxuriance upon her shoulders. The composition is very simple, but very complete, the light and shade being managed with rare skill. The mass of the picture is rendered in a very low key; but the effect is bright and sunny in the extreme, despite the breadth of shade which characterizes the treatment. It is a picture which the possessor will find renewed delight in studying; and we congratulate the members of the Society on the fact that this portrait, or study, has been selected as the presentation-print. Among the seven medals Mr. Robinson has received from this Society, have been awards for the best composition, the best group, the best frame of cartes de visite, the best landscape, and the best picture of any kind; and now he bears off the honours due to the best portraiture. Surely the force of merit cannot further go.

The extra Medals were awarded thus:—

To Mr. Highley, of London, for a series of microscopic slides, the excellence of which is well known to our readers; and

To the Pantascopic Company, for a series of beautiful panoramic views taken by their pantascopic camera.

It will be seen that four of the Medals go to England; the others are awarded to Scottish photographers,—which gives us occasion to remark on the liberality and kind feeling the Society has always shown to English photographers, seeing there is so much talent on the other side of the Tweed.

The statistics of the Exhibition are interesting, and show that dry processes are much more patronized in the North than in England: out of about 700 frames of pictures, about 150 are by processes other than wet collodion; while the last Exhibition of the Photographic Society of London contained only one specimen by a dry process! Amongst the dry processes collodio-albumen is the most prominent, both in number of examples and in quality; tannin ranks next in number; and the Fothergill, hot-water, malt, and honey processes are represented. Mr. T. B. Johnston, the Honorary Secretary, to whom much of the success of the Exhibition is owing, shows that waxed paper is not yet obsolete, but that very fine pictures, that lose nothing by being hung side by side with the finest productions of collodion, can be produced by its aid.

It is somewhat difficult in a general notice of such a large number of pictures, in which such evenness of fair quality prevails, to enter into detailed notice of special merit or shortcomings; we may, however, say with truth, there are more pictures which are thoroughly good than there are which are irredeemably bad, although there are examples of each quality.

The medalists exhibit many other valuable photographs besides the prize pictures. In landscape, Messrs. Vernon Heath, Stephen Thompson, Jabez Hughes, Crombie, Peat, M'Farlane, Drummond, and many more merit unqualified approbation. The Edinburgh photographers are especially strong in portraiture: fine examples are exhibited by Messrs. Moffat, Horsburgh, Rodger, M'Glashan & Walker, Dr. Adamson, Dallas, Neilson, and others. Mrs. Cameron exhibits her series of out-of-focus portraits of celebrities. We must give this lady credit for daring originality, but at the expense of all other photographic qualities. A true artist would employ all the resources at his disposal, in whatever branch of art he might practise. In these pictures all that is good in photography has been neglected, and the shortcomings of the art are prominently exhibited. We are sorry to have to speak thus severely on the works of a lady, but we feel compelled to do so in the interest of the art. But we also have to speak in terms of the severest reprobation, on other grounds, of another picture, "Nearing Home," by Bullock Brothers. This is, we presume, a composition photograph, but it is certainly in no sense a pictorial composition. A young person, essentially mundane, and enjoying, we hope and believe, from her appearance, a condition of robust health, is suspended amid cotton-wool clouds with arms uplifted, and is supposed to represent the disembodied spirit's flight into rest and immortality. The inspiration of a Scheffer leads us reverently into the region of imaginative art; but we think there is something of irreverence in the photographic representation of a clumsy woman taking a "header" into heaven.

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[*] Mr. Robinson has left Leamington for the metropolis, where he now devotes himself to advising and teaching photographers.—Ed.

When we commenced this notice, we intended to pass over the few bad examples we met with, and notice only a few of the prominently good photographs; but we could not let a picture which makes a farce of serious things, like the one we have just mentioned, pass without a protest. We are glad to be able to conclude with unreserved praise to the excellent Secretary, Mr. T. B. Johnston, for the completeness of the Exhibition and the perfection of the general arrangements.

The Wöthlytype for Photography on Ivory or Wood. By G. Wharton Simpson.

The chief difficulties of printing an image from a photographic negative on surfaces like those of ivory and wood have arisen from their imperfect and unequal absorption of the sensitive solutions. If these substances were first treated with a soluble chloride, and then submitted to a silver bath in the same manner as paper, a sensitive surface was obtained, but of a very unequal character, the variation in the texture of the material being distinctly marked by the unequal intensity in different parts of the image. To overcome this difficulty, various methods have been tried. The surfaces have been coated with collodion or albumen containing the haloid salts to be made sensitive by the action of the silver bath. These plans have answered to a certain extent; but still serious difficulties remained. The collodion-film remaining, destroyed one of the great charms which ivory possesses for the miniature-painter—the suitable texture of surface for his work; and for the wood-engraver it was still worse, as it was apt to chip up in the course of cutting with the graver, and obliterate the work. The albumen had the same objections, but in a less degree, yet still sufficient to mar the effect very seriously. If the collodion-film were removed, the whole image generally disappeared with it. The albumen-film, when removed, did leave some image behind; but its removal satisfactorily was generally a troublesome task.

In the course of some recent experiments on ivory, I have found that the Wöthlytype process possessed every quality for giving the most satisfactory results on these surfaces. The prepared surface of the ivory is coated with the sensitive Wöthlytype collodion, exposed under a negative, toned, fixed, and washed in the usual way. When complete and dried, a few drops of ether and a piece of cotton wool remove the collodion-film, leaving a perfect image on the ivory underneath.

If a horny collodion be used, the image will be more perfectly retained within the film; and it is for this reason not suitable. I have used a collodion made from a somewhat powdery pyroxyline, saturated with nitrate of uranium, and containing about 4 grains of nitrate of silver to each ounce. It prints somewhat more slowly on ivory than paper, tends to produce a more vigorous image, and requires very little over-printing, especially if submitted to a bath of dilute acetic acid before toning and fixing; for we find that with Wöthlytype prints the image is much less reduced during toning and fixing, if it have been submitted to the bath of acetic acid and water first. By remaining in this solution five or ten minutes the uranium salt is dissolved out of the film, and the print may now be submitted to the action of a toning and fixing bath, consisting of gold and sulphocyanide of ammonium; or it may be toned in a bath of chloride of gold and acetate of soda, and then fixed in a solution of sulphocyanide of ammonium, one part, in ten of water. I have tried both plans, and with ivory have obtained the best results by using the acetate bath. A thorough rinsing completes the operation.

So far as the process is concerned, the operation is perfectly easy, and there appears to be no difficulty in getting good results; but there is one source of failure to be guarded against, which is in the preparation of the ivory itself. In the first experiments, I used the tablets of ivory as sold by the artists' colourman, ready prepared for miniature-painting, the surface being apparently everything that could be desired. When the picture was finished, however, I was wofully disappointed: by some means or other a factitious surface had been given to the tablet, without really removing the saw-marks, which now appeared in deep but fine ridges, quite sufficient to spoil the effect, and to give the appearance besides of a print which had not been in proper contact with the negative in the pressure-frame.

In subsequent operations I found it desirable to prepare the ivory myself. This is very simply done. A suitable piece having been selected, as free from grain as possible, all traces of saw-marks must be removed by means of a steel scraper or a piece of glass. This being done, the ivory is placed on a piece of board, and a few drops of clean water and a little very fine pumice-powder quite free from grit applied. The surface is then carefully smoothed by this, rubbing all over with a circular motion. A glass muller is the right thing to use, I believe; but I have found a new cork bung answer admirably. When every trace of mark or scratch of any kind is removed, the tablet is ready for use. If a little cuttle fish-bone in powder be used dry to finish with, the texture of the surface will be improved.

There is, of course, a difficulty in printing on ivory not easily overcome. It cannot be turned back, like paper, in order to examine the progress of printing. I have found, however, that if it be thin, and care be used, it is possible to raise it up sufficiently to judge of the progress without any danger, and have done so in all the experiments I have tried.

It is important to remember that, for the purposes of the miniature-painter, a light, delicate, sharp impression, as full of detail as possible, and without dark shadows, is required. A soft negative will generally answer the purpose best.

By using the same manipulations throughout, employing a prepared block of boxwood, the photograph may be printed on wood for the engraver, more simply and efficiently than by any other plan I know.

I hope shortly to describe a process in which the photographic image may be very easily and perfectly printed on canvas for the purposes of the oil-painter.

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On the Action of Ozone upon Insensitive Iodide and Bromide of Silver. By M. Carey Lea, Philadelphia.

A statement has recently appeared in a French scientific journal, 'Les Mondes,' to the effect that ozone is capable of giving sensitiveness to insensitive iodide of silver. M. J. P. Kaiser states that he has found that certain vapours, such as the vapour of benzine, exercise a powerful effect of this kind, converting one insensitive variety into one that was highly sensitive; that he attributed this effect to the ozone produced by the contact of this vapour with atmospheric air; that he therefore experimented with air ozonized by a galvanic induction apparatus, and found the same results produced, but in a much more marked degree.

This statement was not altogether the first suggestion of the matter which I had seen. A French photographic journal narrated, a few months back, a case in which a photographer, whose plates had refused to afford any image at all, restored their sensitiveness and got them into satisfactory working order by simply generating ozone in the room. To this latter statement I was disposed to attach little importance; but the explicit and circumstantial one just above referred to was a different matter.

Those who put forth those statements do not seem to have been aware of their true importance. Not only would such a fact be of great theoretical interest, but its practical applications would be immense, especially in reference to outdoor photography, the easy execution of which on wet collodion would at once have become practicable; for plates could be coated with insensitive iodide of silver in ordinary light (say, for example, after Mr. Sayce's formula). This plate could be placed in an ordinary dark slide, and a vessel containing the means of generating ozone could be placed in the camera. On withdrawing the dark shutter from the slide, the plate would be uncovered and exposed to the ozonized air of the camera. In due time the lens would be uncovered, and the image allowed to fall on the now sensitive surface. The development would then be effected in one of Weiske's developing-cases, and thus the whole process would be reduced to the utmost simplicity.

In view, therefore, of the interest which attaches to this question, I was led to make the following trials:—In place of using ozone generated by electricity, as done by M. Kaiser, I preferred to generate it by chemical means, viz. by phosphorus and also by the action of sulphuric acid on chameleon-mineral. As the source of the ozone was not the same as that used by M. Kaiser, my results cannot be considered as strictly controlling his; but the action of ozone from the two sources is so similar that we should naturally expect similar results in the two cases.

A. *Ozone by Phosphorus.*

The ozone was generated in a large bellglass, and the experiments were not commenced till paper impregnated with starch and alkaline iodide exhibited an immediate and strong ozone reaction.

I. *Action on Iodide of Silver.*—Paper was plunged into an ordinary negative bath, and dried. Strips were immersed in solution of iodide of potassium, and, without leaving them in too long, were next thrown into clean water and washed.

1. A piece of this paper, thus imbued with wahsed insensitive iodide of silver, was placed in the ozone-apparatus for two minutes. It was then exposed to diffused daylight for six seconds. The application of an iron developer produced no darkening whatever. A longer

exposure to light was also without effect. The paper was just as insensitive as before being exposed to the ozone.

2. The effects of a longer exposure to the ozone were next tried. The paper, prepared as before, was exposed for half an hour to the action of the ozone, and exposed to a moderate diffused daylight for twenty seconds. The iron developer produced no effect whatever.

3. Same as 2, but exposed to light for thirty seconds. Result as before.

4. The paper was prepared as before, but, after immersion in the solution of iodide of potassium, the washing in water was omitted, and the strip was placed in the ozone-apparatus just as it left the solution of iodide. The paper immediately changed to a deep chocolate-brown, while still in the ozone-apparatus. This effect was at once attributed to the action of the ozone on the free alkaline iodide; but, to place the matter beyond doubt, the paper was thrown into a solution of hyposulphite of soda, which instantly bleached it.

It seems hardly likely that this reaction, so well known, could have been mistaken for an indication of sensitiveness to light. Perhaps, if the exposure to ozone had been conducted in diffused daylight instead of in a dark room, a careless experimenter might have been misled, by the similarity of the chocolate-brown colour produced to that so often occurring in photography, into a misapprehension of the agency at work, and might have supposed that the ozone had rendered the insensitive iodide of silver sensitive to the diffused light of the room. Such an error seems, however, unlikely.

5. Paper was prepared as before, was exposed fifteen minutes to the action of ozone, then one minute to the light of a strong argand gas-burner, one half being protected from the light. An iron developer was then applied. No effect was produced, nor could the side exposed to the light be distinguished in any way, after the application of the developer, from that which had not been exposed.

[It was previously ascertained that a sensitized collodion plate placed in the same position as respects the same light was powerfully impressed in twenty seconds, or one-third the time just mentioned.]

6. Paper was prepared in the same manner; but after placing in the solution of iodide, and washing, it was dried, and in this condition exposed to the ozone for fifteen minutes. Then to the same gas-light for one minute, partly covered. Result same as number 5.

7. After treatment with silver and iodide, and washing, the paper was exposed to ozone for fifteen minutes, then to the same gas-light as in 5 and 6 for one minute, partly covered. It was then developed with pyrogallic acid to which nitrate of silver and citric acid had been added, and this was kept on till the paper was blackened by the deposition of silver. Not the slightest distinction could be traced between the parts that had been exposed to light and those that had been protected by thick yellow paper.

II. *Action on Bromide of Silver.*—8. In order to give a greater variety to the experiments, the bromide of silver submitted to trial was not disseminated through paper as was done with the iodide in the foregoing trials, but was used in a collodion-film. For this purpose a collodion was made somewhat similar in character to that proposed by Mr. Sayce, in which the bromide of silver is suspended in the collodion with its sensibility destroyed by the presence of a small excess of alkaline bromide. The proportions used were as follows:—

Ether	½ ounce.
Alcohol	1 ,,
Pyroxyline..........	10 grs.
Bromide of ammonium	9 ,,
Nitrate of silver......	13½ ,,

These proportions leave a slight excess of bromide of ammonium present, which ensures that the bromide of silver is in the insensitive form.

9. A portion of this collodion was poured on glass and exposed to a highly ozonized atmosphere for three minutes. It was then exposed to a large gas-light for fifty seconds. On the application of an iron developer no darkening was observable.

10. In order to afford a term of comparison, a film of ordinary collodion was sensitized in the negative bath in the usual manner, and was exposed to the same light for twenty seconds. On the application of the same developer it was strongly darkened.

11. The same collodion as in 9 was exposed to the same ozonized atmosphere for 45 minutes. It was next exposed to the same gas-light as 8 and 9 for thirty seconds. The application of the developer produced no darkening.

12. Same as 10, but exposed to light for one minute and a half. Result as before.

13. Same, but exposed to light for three minutes. Result as before. In no case was the slightest reducing effect produced.

B. *Ozone by Chameleon-mineral.*

Action on Bromide of Silver.—The bromide of silver was used in the same form as before, viz. in collodion containing a small excess of bromide of ammonium. I should have mentioned before, that the insensibility to light of this argento-ozonized collodion was first carefully tested and proved. Ozone was generated in a closed box by the action of undiluted sulphuric acid on chameleon-mineral, the vessel containing which was set aside for a short time to let the purple vapours pass off. It was then set in the box, and the condition of the atmosphere was examined from time to time by appropriate test-paper.

14. Before commencing with the ozono-trials, a piece of glass was collodionized with ordinary collodion and sensitized in the negative bath. It was then exposed to a weak diffused daylight for thirty seconds, after which it immediately darkened under the developer. This was to determine the action and power of the light in question.

15. The collodion containing insensitive bromide was exposed to a weakly ozonized atmosphere for ten minutes. It was then exposed to the same daylight as the ordinary sensitive plate mentioned in 14, and for the same time. An iron developer was then applied, but not the slightest indication of sensitiveness was observable.

16. The last experiment was repeated under the same conditions, but with a treble exposure to the action of the same ozonized atmosphere, viz. thirty minutes instead of ten. The exposure to light was the same, and the insensitiveness the same.

17. Instead of a weakly ozonized atmosphere, as in the last two cases, a strong one was prepared, and a plate similarly prepared with insensitive argento-bromide collodion was placed in it ten minutes. It was then exposed to the same light and treated in the same manner as in the experiment immediately preceding, and with the same results: not the slightest indication of sensibility.

In this last experiment, the atmosphere was ozonized sufficiently to render iodide of potassium and starch paper instantly blue. In the two previous, this reaction showed itself more gradually.

In remarking upon the experiments just detailed, I may observe in the first place that the ozone was unquestionably always present in such strength as to bring out its marked chemical effects. This was demonstrated not only by its action on the characteristic test-paper, but also by its chemical action exhibited in experiment 4.

Again, the experiments were tried in the most varied ways. The ozone was produced in two different manners, and of varied strength. The surfaces to be tested were also exposed for widely varied times, from two minutes to forty-five.

The nature of the light was also varied, experiments having been made both with daylight and artificial light. The time of exposure to light was very various, and in several cases, after the first results had been noted, the paper or film, still wet with the developer, was carried into the light and exposed for some time, to see if any faint sensibility existed and would manifest itself by the prolonged action of light. No such result appeared. The experiments included both iodide and bromide of silver; and both paper (of which two different sorts were intentionally used) and collodion were used as the vehicles for the silver compound.

The result appears to show pretty clearly that ozone has no power of giving sensibility to insensitive iodide or bromide of silver formed in the presence of excess of alkaline iodide, whether the excess be left present, as in the bromide experiments, or be removed as in those made with iodide; or at least that this is true in respect to ozone produced in the two manners which I have described. If M. Kaiser has really succeeded in sensitizing plates in the manner described by him, I think that result might possibly be ascribable to some direct effect of the induced electricity which he employs, and not to the ozone produced. But the description of his experiments which has reached me in the 'British Journal' is so brief (no details whatever are given) that the above can only be considered as a mere suggestion of an explanation of the opposite results obtained by him. The whole subject is an interesting one; and the effect of all the forms of physical force, especially electricity and heat, on the silver haloids might no doubt be advantageously studied.

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Mr. Pouncy and his Carbon Process.

[To the Editors of the 'British Journal of Photography.']

GENTLEMEN,—It need not surprise you if, from my connexion with the public press, I take a warm interest in seeing justice done to the photographic fame of my fellow-townsman, Mr. John Pouncy, the inventor, and, I may say, the perfecter of carbon printing.

I have watched Mr. Pouncy's progress from the production of his first carbon photographs, early in 1858 (some of which I have in my possession), and I am able to vouch for every one of the facts adduced by him before the Photographic Society of Scotland, last month, at Edinburgh. Having been always glad to promote the development of his researches in lending my aid to lay them before the public, my only regret has invariably been that the newspaper press can do so little in vindication of a scientific discoverer; and that in a case like Mr. Pouncy's it must rest exclusively with the photographic journals to do justice to his genius. Nor should you now have heard from me had this task of theirs been faithfully performed; but here, alas! if ever, has been verified the sacred adage—"A prophet is not without honour, but in his own country and among his own kin."

The cause of my now addressing you is, in fact, a flagrant instance of injustice done to Mr. Pouncy, which I find in the 'Journal of the Photographic Society' of Monday. I have always held it to be about the most reprehensible thing in journalism to impede the progress of individuals engaged in the prosecution of useful discoveries by assailing them with a vindictive bias; and surely the 'Journal of the Photographic Society' ought to be the last in which one would expect to find a man—whose paper, read at Edinburgh so recently as the 13th December last, was, by Sir David Brewster himself, proclaimed "one of the *most important* that has ever been submitted to this Society"—attacked in an attempted review of "the past year." Yet, in the strongest language upon which the attempt to discredit and prejudice Mr. Pouncy's endeavours could dare to venture, the 'Journal of the Photographic Society' has spoken of him as "still struggling with his printing-ink process," and it is contemptuously added:—

"We believe has made some progress; he has not advanced so far, however, as to justify us in the anticipation of any very perfect results. It is to be regretted that, by laying claim to all the credit of the invention of carbon printing, Mr. Pouncy has done much to prevent the recognition of the value of his really ingenious modifications. It is well known that the principles of the process were discovered and patented, in 1855, by Poitevin; an improvement was made by Beauregard in 1857; and we heard nothing of Mr. Pouncy's process till 1858."

Now, since there are in this very strong passage, which seeks to snatch away the reputation of a fellow-countryman to bestow it upon foreigners, exactly as many errors as there happen to be distinct and definite expressions, it can occasion no astonishment that, at this moment, your own Journal and the 'Journal of the Photographic Society' itself should alike be occupied in discussing "rumours"—"false rumours," as they are termed—"to the effect that the 'Journal of the Photographic Society' (owing to inefficiency in its management), having become utterly unworthy of support," the Council had decided to merge it into one of your contemporaries. Deprecating as I do everything spiteful in the relations of rival journals, I am glad to witness the spirit in which you interpose in this delicate condition of affairs, by publishing Mr. Glaisher's letter, which states that the Council of the Society have appointed a Journal Committee, consisting undoubtedly of most competent persons—Dr. Wright, Messrs. Davis and Sedgwick, Dr. Diamond, and Mr. Glaisher himself, "to improve the Journal generally." And I would most respectfully suggest that one of its most obvious improvements would for the future consist in abstaining from throwing obstructions in the way of photographic advancement, by its incessant attempts to injure, if not insult, meritorious inventors and discoverers. Of such attempts Mr. Pouncy's case is not a solitary example; for I see in their last issue that precisely the same treatment is bestowed on Messrs. Johnson and Harrison's admirable patent, the pantascopic camera, as indeed seems to be the course systematically pursued in the Society's Journal towards all who happen to introduce anything really good in photography. The authority of a great Society exercises an important influence over any branch of discovery, and the opinion of its official organ ought to be paramount. The new Journal Committee, however, may rely on it that neither they nor it will ever attain their true position, or command that respect to which they are entitled, until they utterly repudiate these petty obstructions, and cease to reiterate exploded prejudices intended to put down the just and honourable claims of "struggling" inventors.

It is most ludicrous to contrast the statement, for instance, in the Society's Journal, that Mr. Pouncy has not advanced so far in his process during "the past year" as to justify even the "anticipation" of *any very perfect results*, with the absolute facts of the case, as recorded in the self-same number of that very paper, in the proceedings at Edinburgh. In his offhand remarks there printed at length, and which also appear in your last number, Mr. Pouncy has given clear and explicit evidences of his astonishing progress, and of the *all but* perfect results he has obtained. And what say the learned and scientific men who heard his observations then delivered, and saw him perform before them the "frequent experiments" with which they were illustrated?

Professor Moir, whose verdict as a man of taste as well as of scientific skill in photographic manipulation I would accept as soon as that of any in Edinburgh, while speaking of *the prospect* of securing tolerable permanency even in silver, not only says, "but still it is an immense advantage to be enabled to fall back on a process which promises—and, I suppose, really performs—permanency," but adds also, "but if we can get a process which secures permanency and, at the same time, brilliancy of effect, I think that is one of the greatest boons to the photographic artist. But I should have cared very little," continues he, "for Mr. Pouncy's process had it merely given us permanency. I think no one who has seen his best pictures, or has witnessed his experiments to-night, can entertain the least doubt that, in addition to permanency, he also gives brilliancy of effect." Could any verdict be more decisive? Not unless that of Mr. Kinnear be so, who, in seconding Professor Moir's motion, congratulated Mr. Pouncy *on the great progress he had made,* his pictures being now infinitely superior to those he had produced a few years ago, and indeed many of them *nearly as good—some of them quite as good—as silver prints.* I ought to notice that Professor Moir had also said, "It is enough for us that he (Mr. Pouncy) has shown us how to secure a reasonable amount of permanency, and given us prints to which no one can object, because, in truth, *the best of them are quite equal to the silver process.*" All this Sir David Brewster, the highest living authority on all points connected with the action of light, heard with his ears and emphatically endorsed with his voice as Chairman; and he conveyed the thanks of the meeting to Mr. Pouncy "for his valuable and instructive communication—one of the most important," said Sir David, "that has ever been submitted to the Society."

Which are we to believe—this, or the Journal of the Photographic Society's simultaneous assertion that no progress had been made, and nothing like perfect results attained, by Mr. Pouncy?

And what, then, can the Society's Journal mean by its violent contradiction of such an estimate as this of Mr. Pouncy's progress and success?

His great offence would seem to consist in his laying claim to the invention of carbon printing. It is difficult to understand why this claim should be denied in a quarter that ought rather to feel proud of it. He does lay claim to it; he did so in as many words before the Photographic Society of Scotland, and he did so in France, and gained for it the Duc de Luynes's and other awards. But how this can possibly have "done much," or done anything, "to prevent the recognition of the value of his really ingenious modifications," as the 'Journal of the Photographic Society' alleges, it baffles all power of human conjecture to imagine.

Envy and illnature may oft, indeed, seek totally to reject the higher pretensions of an inventor by affecting to admit his merits in a minor degree. Throwing contempt on his title to originality, and counselling him to stop short at some "ingenious modifications" of the discoveries of others, the value of even that which he has done is menaced with a want of recognition unless these higher pretensions are renounced. Is this worthy treatment for my able and enthusiastic fellow-townsman—everywhere else joyfully recognized as the first practical producer of the carbon-printing process—to meet with at the hands of the Photographic Society and its official Journal?

Recollect that at the identical passage in which it laments being prevented from due recognition of Mr. Pouncy's "value," it had as good as asserted that there was no value to recognize!—deprecating in one breath "the anticipation of any perfect results," and in the next absurdly admitting "his really ingenious modifications." Such glaring contradictions and preposterous inconsistencies are disgraceful to the journal of a metropolitan Society, because they can only be dictated by sinister motives, calculated to obstruct rather than encourage an enterprising career like Mr. Pouncy's. The worst that can happen in such circumstances is where the part of the dog in the manger is thus enacted by authority.

With regard to foreign inventors and their claims, to this day we know not exactly the practical principles of Poitevin's process; in fact, whatever they were, they were never reduced to practice. Mr. Pouncy having been, in all this world, the first man who ever produced a carbon print in photography, Poitevin in 1855 may, therefore, have patented whatever he pleased—Beauregard, in 1857, have improved whatever he liked. Mr. Pouncy announced before the Photographic Society of Scotland last month his willingness to give £5 each for any specimens of carbon photographs, with satisfactory proofs that they were produced prior to his; and if any such were in existence, he would inevitably have heard of them before now—patented or not patented, improved or unimproved.

In conclusion: I happen to know, of my own knowledge, that Mr. Pouncy's are not "ingenious modifications" of anybody's notions, but original inventions and discoveries, reached after many trials, and in the course of a lengthened prosecution of some means of obtaining permanency for his curious publication of photolithographs, "Dorset Photographically Illustrated." Not simply in 1858, but, I believe, in 1857 he had imparted to me his secret, and I minutely remember its entire development from stage to stage. I hope, therefore, you will readily excuse my attempt to set him right with the world, in opposition to the injustice of the 'Journal of the Photographic Society;' and thus let the press, as it ever should (to whatever department of knowledge devoted), be found the defender of right against might—of truth against misrepresentation. I am, yours &c.,

W. WALLACE FYFE.

Dorchester, January 18th, 1865.

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Mr. Pouncy and Carbon Printing.

To the Editor of the Photographic Journal.

SIR,—With a singular pertinacity of recurrence, the claims of Mr. Pouncy in connexion with carbon printing are once more brought before the photographic world. First in a paper by himself, printed in your journal a fortnight ago; and next by one of the over-zealous injudicious friends, by whom he has the misfortune to be surrounded, in a letter in the last Number of one of your contemporaries. Few men have had more occasion to exclaim, "Save me from my friends!" than Mr. Pouncy. The inflated, foolish and false flattery of fulsome friends have done much, in the first place, to lead him to believe, in the face of the most unchallengeable evidence to the contrary, that he is the inventor of carbon printing; and in the next place, that he has brought it to a degree of perfection which promises for it a speedy practical adoption. The first error is of little consequence, except to Mr. Pouncy and his friends, as constant reiteration of that which is so easily proved to be untrue, has no effect on the public mind, beyond producing a feeling of annoyance and contempt.

The second error is one of more general consequence to the public, and to the art, than the first, as it effectually tends to retard progress in a really valuable invention; for so long as Mr. Pouncy believes in the present perfection of his process, so long, it is probable, will he pursue the narrow-minded policy which has guided him hitherto, of persevering in a foolish silence or reticence regarding all details not absolutely necessary to be made public in the specification of his patent, and so effectually deter others from experimenting in a path in which he evidently deprecates, rather than invites, cooperation. As no photographic process, or indeed any other process of art or science, is likely to attain perfection through the efforts of one totally unaided man, we cannot hope for much of a perfect or practical character in his process, until the united suggestions of many minds, and the skill of many hands, have been brought to bear upon it. I have no intention of following the writer of the letter I have alluded to (Mr. W. Wallace Fyfe) through his long series of assertions, unsupported by one tittle of proof; but having read Mr. Pouncy's paper before the Photographic Society of Scotland, and the remarks thereon,—having read also the able article in the Journal of the Photographic Society, briefly reviewing the progress of photography during the past year, in which Mr. Pouncy's productions and claims are referred to,—having, moreover, been an early experimentalist in carbon printing,—having seen Mr. Pouncy's specimens, and having taken a deep interest in his, and all other progress in that direction,—I cannot forbear making one or two observations thereon.

Before entering into an examination of the subject, permit me to make one remark on the passage in the Society's Journal. Mr. Fyfe seems to perceive an "absurdity," "glaring contradictions, and preposterous inconsistencies," which "can only be dictated by sinister motives," in the remarks of the 'Photographic Journal,' to the effect that Mr. Pouncy's modifications are really ingenious, although not admitting at present of very perfect results. It appears to me, Sir, that no more just appreciation of Mr. Pouncy's real claims could have been expressed; and the inconsistency, absurdity, or contradiction I am utterly at a loss to perceive. Mr. Pouncy's modifications are, undoubtedly, ingenious: he has, as undoubtedly, made some progress, and the most that his violent and injudicious partisan (Mr. Fyfe) ventures to claim for him, is "*all but*" perfect results. In regard to the 'Photographic Journal,' I, in my simplicity, had regarded the article on the "Past Year" as one of the best evidences of the promises of renewed vitality, as a healthy, outspoken expression of opinion.

I will now, very briefly, proceed to examine the grounds upon which Mr. Pouncy's claim to be the discoverer of carbon printing depends. In 1855, M. Poitevin patented in this country, as well as in France, a method of producing photographic images in carbon. In his specification, now before me, he says—

> I apply various liquid and solid colours upon paper, cloth, glass, and other surfaces, by mixing such colours with the aforesaid mixture of a chromate or a bichromate with organic matter, and applying this new mixture or combination to the paper, or other fabric, or surface.
>
> The photographic impression is produced upon this prepared surface by the action of light passing through a negative photographic picture, or an engraving, or other similar object or screen, or in the camera obscura, and it is then washed with a sponge and a large quantity of water.
>
> The albumen, or rather organic matter, is rendered insoluble at the parts where it has been acted upon by the light, and the design is thus produced in the colour which has been employed.

In 1857, M. Beauregard patented a similar process with some modifications, described in his specification thus:—

> This invention relates to the production of photographic images, pictures, or proofs, without salts of silver. For this purpose, carbon or other pigment is employed; and it is fixed on the paper or other surface by means of a preparation which is acted upon by light. If gelatine or gum be added to a saturated solution of bichromate of potash and ammonia, and the mixture, after being dried, is exposed to solar light, the gelatine or gum is rendered insoluble in water.
>
> If, before exposing the mixture to light, an insoluble colouring material is added to it, such as carbon or blacklead for a black colour, &c., or other pigments, or mixtures of pigments, the result is, when the mixture is exposed to light, and thus rendered insoluble, the colouring matter or pigment is imprisoned and retained by the mixture, and rendered indelible. When such a preparation is exposed to light, under a photographic negative, or other transparent, or partially transparent picture, and is afterwards washed with water, the pigment becomes fixed at those parts where the light acts upon it, but is removed by the water from the parts which are sheltered from the light, so that the picture is reproduced in a similar manner to that in which pictures are reproduced by the ordinary photographic processes with chloride of silver. This mode of proceeding is not new, but in applying this principle in practice there are certain difficulties to overcome; thus it is necessary to preserve the whiteness of the paper in the whites of the picture, and to prevent the adhesion or fixing of the pigment or colouring matter in the parts which have not been exposed to light, and also to employ the pigment in an extremely fine state of division.

In 1858 Mr. Pouncy announced, in the 'Photographic Notes,' his discovery and intended patent of a similar process, but was dissuaded from going to the expense of a patent on the ground that a similar process had been already patented by M. Poitevin. Perhaps the most satisfactory evidence which can be educed as to the character of the real facts will be a reference to an authority who has always been favourable to Mr. Pouncy. In the 'Photographic Notes' for November 1st, 1858, Mr. Sutton gives a summary of carbon printing as it then stood. To Mr. Mungo Ponton he ascribed the first step in these processes; the next step he attributed to M. Poitevin, in 1855; the next to M. Beauregard, in December 1857; the next step, he says, was taken by himself, and described in January 1858. He then adds, "Now comes the part which Mr. Pouncy has played in this matter. In the month of March in the present year [1858], that is, about two months after he had seen the remark in this Journal (to which he has been a subscriber from the first), he enclosed us some carbon prints, in which the whites were clean and the blacks black; and on the 10th of April he patented the process provisionally." He subsequently adds, in the sam article, "to us it appears that Mr. Pouncy wa the first to produce a presentable carbon print.' Now, as the question of what constitutes a *presentable* carbon print must be a matter of tast or opinion, and as the discussion is not as t who first produced presentable prints, but as t who originated the process, it appears to m that this is tolerably conclusive evidence agains the claims I am combating.

These are facts resting on published dat and not upon the assertions of any of th partisans of the gentlemen concerned. Mi Pouncy and his friends ignore these facts, an in support of their assertions thereon resort t a process familiar to the readers of sportin journals, but happily unknown and unrecog nized in support of scientific and historic truth Because the two first-named gentlemen are residents in another country, and probably neve by any chance became acquainted with Mi Pouncy's magnificent offer of £5 apiece fo any copies of carbon printing produced at a earlier date than his own; because, even i such an offer came under their notice the would probably treat it as a piece of foolis gasconade; and because, even if they, too, regarded it as a *boná fide* offer, and produced th desired evidence, it would probably be very difficult, if not impossible, to satisfy Mr. Pounc or his friends of their authenticity and prio date to his own; therefore it is to be assume that two gentlemen of acknowledged scientifi reputation and position incurred the expens of patenting in two countries processes whic they had never tried, and, in short, had no discovered! Why, Sir, is not the propositio an insult to common sense?

Let me be distinctly understood. I do no wish in any way to detract from the ingenuit and indefatigable perseverance of Mr. Pouncy nor in any way to depreciate the excellence o many of the prints he has produced, some o which I have seen and admired. His aim is most laudable one; the production of photographs in a material so permanent as printin ink is an end to be desired by all lovers of th photographic art, and I heartily congratulat Mr. Pouncy on the measure of success he ha attained. I think it is quite possible, moreover, that his efforts and results have scarcel met with the full meed of public appreciation His own unfortunate tendency to secretiveness and the injudicious laudations and absur claims of his friends, are, I believe, chiefly responsible for this. The general silence of th members of the Photographic Society of Scotland speaks volumes as to the general impressions of the claims made. The inquiries of recent letter-writer, signing himself "One who wants to know," in a contemporary, who asks for formulæ how to make sensitive ink; the proportions of bichromate; how much greasy matter, and of what composed; which of the many kinds of ink (copper-plate, lithographic, or letter-press) may be used; how the transparent paper is made; and how the sensitive ink is applied to it; and many other questions on which Mr. Pouncy has never afforded any information, are really the inquiries of photographers at large. When Mr. Pouncy is prepared to answer these inquiries, he may feel assured of a much wider interest in his process. When he, or any one else, is prepared to undertake printing by his process on a commercial scale, he may feel assured of a more general appreciation of his method of printing at its true worth; and when he is willing to accord to fellow and prior labourers in the same field their due meed of credit, he may be assured of a more general recognition of his own real claims. J. Carus Crofton.

[We feel bound to give insertion to the above letter from Mr. Crofton, as it fully supports our present views on Mr. Pouncy's carbon processes; at the same time we must state our wish that Mr. Pouncy and his friends will give us credit for treating his claims with perfect impartiality, and should he favour this Journal with a communication, or, if possible, appear before the Society at an early Meeting, and state any recent novelties in his discoveries, a most welcome reception will be given to him. We can speak from our own knowledge that every wish to do him justice was evinced by the Jury of Class XIV. Mr. Pouncy, being dissatisfied by the decision arrived at, addressed a letter of remonstrance to Her Majesty's Commissioners, and which was referred to the Jury for their *reconsideration*; but no alteration was effected in the minds of those who had already made their awards, and their decision to that effect was unanimous.—Ed.]

Transference of Photographs to Ivory, Porcelain, Marble, &c. By A. Rinet.

Unsized satin paper is coated on one side with starch. When quite dry, the untouched side is covered by means of a brush with a layer of the following solution:—Distilled water 20 grs., sugar-candy 1 gr., ammonio-citrate of iron 20 grs. The prepared paper, placed in a copying frame under a negative, is exposed for ten minutes to the sun. To develope the picture, it is brushed with a very fine powder of any colour. The image is fixed by pouring upon it glacial acetic acid and allowing it to dry. The object to which the picture is to be transferred is washed with alcohol. Then a tolerably fluid mixture of ether and venice turpentine is made; this varnish is laid with a small camel's-hair pencil on those parts which are to come off, without passing over the outlines. The picture is pressed upon the surface to which it is to adhere, and wetted on the back with a moist sponge. The back of the paper is then rubbed over with the nail several times and raised. The picture remains adhering to the object.—*Photogr. Archiv*, 1863.

Proposition of a Guarantee Fund for Photographic Exhibitions.

From the report presented at the last Meeting of the Photographic Society, it appears that for years past the Exhibitions have involved a loss to the Society, the cost far exceeding the income. The accounts of the two last Exhibitions each showed a deficit of over £100. It is quite clear that such a state of things could not be prolonged indefinitely. However willing the Society might be to promote the interests of the art, a time must come when they could not afford to do so at a heavy loss. That time, it appears, has already arrived; and although some short Exhibition is talked about, the Society cannot at present incur the risk of another Exhibition held in the ordinary way. The sources of the failures, in a commercial sense, of these Exhibitions it is unnecessary to discuss here: they doubtless spring from various causes. Neither is it necessary to enlarge on the importance of such Exhibitions at once as landmarks of progress and incentives to further improvement. Photographers generally recognize this. Our aim is now to propose that all interested in the continuance of the Exhibitions should form a guarantee fund to meet any loss arising therefrom. Let the Exhibitions be held under the auspices of the Society as heretofore. Let a committee of management be chosen, half from members of the Society's council and half from the body of the guarantors. Should it happen, by any chance, that a good and well-managed Exhibition be a success, let the profits go to the funds of the Society. Should there be a loss, let it be made up out of the guarantee fund, subscribers only being called upon to contribute in the definite ratio for which they, in the first instance, make themselves responsible. We have not time or space to suggest further details now, but shall be glad to receive communications from any of our readers interested in the subject.—*Photographic News.*

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Indian Photographs.

Early in the summer, the publication of a magnificent series of photographs, of the greatest interest in an ethnographical sense, will be commenced under the auspices of the Indian Government. This will be comprised in five folio volumes, containing in the aggregate 400 photographs of the people of India in all their important races and castes, their costumes, manners and customs, their modes of living, and manufacturing processes, from that of the man and his craft which are concerned in the humblest trades, to those who practise the immemorial skill which produces magnificent shawls and kincobs of cloth of gold or silver. Here we have the native goldsmith at work, spinning metal into filigree; there the embroiderer; there the smith, the potter, the cook, the weaver, the carpenter, &c. Dr. Forbes Watson and Mr. Kaye, of the India Museum, have this work in charge, and will contribute its appropriate text.

Photographs in Colours.

An article on scientific discovery in the last number of the 'Revue Contemporaine,' by Dr. H. Montucci, gives a detailed account of the last triumph of photographic art, due to the indefatigable researches of M. Chamboy, who has spent the last few years at Port Louis, Ile de France. M. Chamboy has succeeded in fixing the natural colours of the object photographed. The operation is as instantaneous as in ordinary cases, and, if the report be not exaggerated, the likeness obtained has all the delicate colouring of a pastel drawing and the minute accuracy of miniature-painting. The question arises whether a similar result can be obtained in our foggy climate. Dr. Montucci reminds his readers of the contrast between the marvellous clearness of the air in the southern hemisphere when compared to even that of the finest summer day in Paris. This has been the grand difficulty which M. Nièpce de St. Victor has so long struggled to overcome in his photographic experiments, and with wonderful success, as M. Nièpce has succeeded in fixing on his proofs, not only reds, greens, yellows, and blues, but blacks and whites, which have been the most difficult to seize. M. Nièpce has had recourse to a very high temperature, which unfortunately has a disastrous effect on all colours produced by light, giving them a tinge of red. When the proof is removed from the dark box in which it has received the impression of the object to be photographed, the whites and blues have a peculiar delicacy of hue, which the process of fixing by heat unfortunately tarnishes. Dr. Montucci does not appear to despair of M. Nièpce's ultimate success.—*Star*, Feb. 6.

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Flattery in Photographic Portraits.—A method has been recently suggested for softening the effect of photographic pictures, and removing the too faithful harshness with which they render some faces. M. Mathey suggests the following method:—"The plan is to have a lace curtain stretched on a wooden frame placed between the camera and the sitter: the farther the curtain is from the model, and, consequently, the nearer it is to the lens, the softer the features appear; the threads of the lace give the *grain* of a chalk drawing or engraving, and the defects of the model are modified and softened down."

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

Inquirer.—The Pantascopic Company have distributed a prospectus, containing a view taken with the new camera, embracing an angle of 120°, and the same subject taken with the ordinary camera in three views: this will enable you to judge for yourself of the success with which the apparatus may be used.

A Member.—A copy of the Rules of the Society has been forwarded. We intend, in an early number of the Journal, to reprint them again. The subscription for the present year terminates in February 1866.

A. A.—The invention is, in our opinion, not new. You will do well to consult the Abridgments of Patents relating to Photography, published by the Patent Office, price 2s.

Photolithography.—1. We cannot inform you where specimens of the early productions of Poitevin may be procured; probably Mr. Malone could assist you. Mr. Osborne possesses a very beautiful one, done in 1857, full of half tone, and in every respect satisfactory.—2. Some time since we applied to Mr. Vincent Brooks, who has great practical knowledge.

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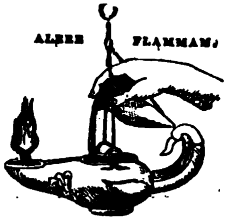
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LAWS OF THE PHOTOGRAPHIC SOCIETY.

The Photographic Society of London shall consist of Ordinary and of Honorary Members.

The Ordinary Members shall elect out of their own body, according to the subsequent regulations, a President, three Vice-Presidents, a Treasurer, and eighteen Members of Council, by whom the business of the Society shall be conducted.

I. *Duty of the President.*

To preside at all Meetings of the Society and Council. To take the Chair at all Ordinary Meetings of the Society at eight o'clock precisely, and to regulate the order of the proceedings.

Should the President be unable to attend, one of the Vice-Presidents shall take the Chair; and should neither the President nor a Vice-President be present, then one of the other Members of the Council shall be appointed Chairman for the occasion.

II. *Duty of the Treasurer.*

The Treasurer shall receive all moneys due to the Society, and shall pay such sums as may be ordered by the Council. He shall keep an account of all such receipts and payments.

III. *The Secretary.*

Shall attend all Meetings of the Society and Council. He shall take minutes of the proceedings, and produce and read them at the ensuing Meeting. If requested by the Authors, he shall read the papers presented to the Council, and shall also conduct the correspondence of the Society.

IV. *Auditors.*

Two Auditors of the Accounts shall be elected at the Ordinary Meeting of the Society in January. They shall audit the Accounts, and produce their report of the Annual General Meeting of the Society to be held in February. They shall have the power of calling for all necessary accounts and vouchers. No Member of the Council shall be eligible as an Auditor.

V. *Council.*

The business of the Society shall be conducted by the President, three Vice-Presidents, Treasurer, Secretary, and the remaining eighteen Members of Council. At all Meetings of the Council five shall be considered a quorum. One of the Vice-Presidents, the Treasurer, together with five other Members of Council, shall go out of office annually, all or any of whom shall, however, be eligible for re-election.

The Council shall hold their Meetings at such times as they may appoint. The ordinary mode of decision of questions before the Council shall be by show of hands, unless a ballot shall have been demanded. Any Member who may be personally interested in the question before the Council shall retire during the consideration and discussion of the same. The Council shall also prepare, and cause to be read to the Annual General Meeting, a Report on the general concerns of the Society for the preceding year.

VI. *Annual Meeting.*

The Annual General Meeting of the Society shall be held on the first Tuesday in February in each year, at 8 o'clock P.M., for the election of Officers and Council for the year ensuing, for receiving the Report of the Council on the state of the Society, and for any other business of which due notice shall have been given.

The Council shall have the power of calling a Special General Meeting of the Members whenever they may see occasion for so doing; and upon the presentation of a requisition signed by twenty Members of the Society, the Council shall be required to call a Special General Meeting within one month of the date of such requisition.

VII. *Election of Officers.*

All Officers of the Society shall be annually elected, with the exception of the Secretary and such Members of the Council as may not go out of office by rotation or otherwise. The mode of their election shall be by ballot. The Council at the Ordinary Meeting in December in each year shall declare the names of the Members of Council whom they recommend to retire, and lay before the Society the names of those whom they have selected to supply their places. They shall also declare the names of the other Officers they recommend for re-election, and cause a list to be suspended in the Meeting-room. In the event of any Member of the Society being desirous of proposing other names than those recommended by the Council, a written list of the same shall be delivered to the Secretary at or before the Ordinary Meeting in January; and the same shall be read from the Chair, and publicly suspended in the Society's room, with the list recommended by the Council; and no Member shall be eligible for election into the Council unless he shall have been proposed in the manner and form above specified.

VIII. *Ordinary Meetings of the Society.*

The Ordinary Meetings of the Society shall be held on the first Tuesday in the months of November, December, January, March, April, May, and June, for the election of Members, reading Communications, and other business connected with the objects of the Society. The Chair shall be taken at 8 o'clock precisely, and the ordinary course of the business shall be as follows:—

1. The Minutes of the Proceedings of the previous Meeting shall be read and submitted for confirmation.
2. The presents made to the Society since the previous Meeting shall be announced, and the thanks of the Society voted to the Donors.
3. The Certificates of new Candidates for election into the Society shall be read and ordered to be suspended in the Meeting-room.
4. The names of Candidates to be elected, whose Certificates shall have been duly suspended, shall be read, and the ballot for their election shall take place.
5. Communications to the Society shall be read

and discussed; the Chair shall be vacated as soon after 9 o'clock as may be convenient, and the Society shall resolve itself into a Conversazione.

IX. *Of the Members.*

The Society shall consist of Ordinary and Honorary Members. The Honorary Members shall be limited to persons not residing in the United Kingdom. Each Ordinary Member shall pay an Admission Fee of One Guinea; and should his election have taken place at the Meetings in the months of February, March, April, May, or June, he shall pay One Guinea as a first Contribution; but should the election have taken place in the months of November, December, or January, he shall pay but Half-a-Guinea as his first Contribution. The Annual Subscription in all cases shall be One Guinea per annum, the first and all subsequent Annual Subscriptions becoming due in advance on the 1st of February in each year. Members may compound for their future Annual Subscriptions by the payment of Ten Guineas in addition to the Admission Fee. Members desirous of thus compounding, may do so at any time during the first season of their admission into the Society. Should the first Contribution have already been paid, the same shall be accounted part of the aforesaid Composition of Ten Guineas.

Gentlemen residing abroad, and desirous of becoming Members of the Society, shall pay no more than the Admission Fee and first Contribution, remaining exempt from all further Annual Subscriptions while absent from this country. Gentlemen also already Members of the Society, who may have occasion to go abroad for any length of time, shall be excused all Contributions during such absence, provided due notice in writing shall have been given to the Secretary previous to their departure.

The payment of the Admission Fee shall be considered as distinctly implying the acquiescence of every Member elected into the Society in all the Rules, Regulations, and Bye-Laws thereof

Every Candidate for admission into the Society must be proposed by two or more Members, who must sign a Certificate in recommendation of him, which must set forth the names, description, place of residence, and qualifications of the Candidate, and state that he is desirous of becoming a Member of the Society; and the proposer whose name stands first upon the Certificate must have personal knowledge of the Candidate. The Certificate shall be read aloud by the Secretary at the first Ordinary or Annual General Meeting of the Society next ensuing, and shall then be suspended in a conspicuous place in the Meeting-room. In order to prevent unnecessary delay, the Council shall have the power, at any of their Meetings, to order Certificates duly signed to be suspended in the room; the election of such Candidates to take place at the next Ordinary or Annual Meeting. The method of voting for the election of Members shall be by Ballot.

The Ballot shall take place at the Ordinary or Annual Meeting at which the Certificate shall have been read the second time, and immediately after such reading; but the Ballot shall be adjourned unless twelve or more Members be present; and when four-fifths or more of the Members balloting shall be in favour of the Candidate, such Candidate shall be declared duly elected.

Ladies also shall be eligible as Members of the Society.

The Ordinary Members shall have the right to be present and to vote at all Ordinary and General Meetings, and to propose Candidates. They shall be entitled to the use of such instruments or books as the Society may possess, under such restrictions as the Council may deem necessary, to receive the Numbers of the Society's Journal as they may appear, and also to free admission to any of the Exhibitions of the Society. They shall have the privilege of introducing one Visitor to the Ordinary Meetings of the Society, and also to any of the Exhibitions of the Society. No Member shall have the privilege of voting on any occasion unless he shall have paid his Subscription for the current year.

Honorary Members shall possess all the privileges of Ordinary Members, excepting those of proposing Candidates, voting, and of introducing Visitors.

X. *Withdrawal and Removal of Members.*

No Member shall be considered to have withdrawn from the Society until he shall have paid his arrears and given a written notice of his intention to resign to the Secretary. Whenever it shall be proposed to remove any Member from the Society, the same shall be done by a resolution of the Council, which shall be read at three successive Ordinary Meetings, and be suspended in the intervals in the Society's room of meeting; and at the last of the said Meetings, the proposition shall be balloted for, and if four-fifths of the Members balloting shall vote for the removal of such Member, he shall be removed from the Society accordingly.

The names of all Members who shall be in arrear of their Annual Subscription for more than two years shall be publicly suspended in the Society's ordinary room of meeting, with the amount of subscription due from each; and unless the sum shall be paid within three months after such suspension, their names shall be liable to be removed from the list of Members.

XI. *Alteration of the Laws.*

No alteration whatever shall be made in any of the Laws of the Society, excepting at the Annual General Meeting, or at a Special General Meeting convened for the purpose, due notice having previously been given to the Council. Notice of such alteration shall be given by letter to every Member residing in the United Kingdom, at least one week before the date of the proposed Meeting; and no other business shall be transacted at such Meeting but that for which it has been specially called, and of which due notice has been given. It is not, however, intended that this should apply to any Bye-Laws made by the Council for the regulation and carrying on of their business.

No. 155. MARCH 16, 1865.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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PHOTOGRAPHIC SOCIETY.

The next Ordinary Meeting of the Society will take place at King's College on Tuesday, April 11th, at eight o'clock, when a paper will be read by Mr. W. Willis, of Birmingham, on his "New Process of Printing from Positives," in which he will demonstrate his method of copying drawings and positive photographs without the previous production of negatives.

Members may now obtain the photograph of "Bringing Home the May," on application to Mr. Mattress, at Messrs. Taylor & Francis's, Red Lion Court, Fleet Street.

Meetings of the Society, 1865.

1865. Tuesday, April	11
" May	9
" June	13

It has been determined that the future Meetings of the Society shall take place on the second instead of the first Tuesday in each month. This decision has been come to chiefly that the report of our own, as well as the proceedings of the Photographic Society of Scotland, should appear as soon after the respective Meetings as possible. The day of publication of the Journal will remain the same, excepting when the second Tuesday shall occur, as it does in the present month, on the 14th. When this is the case, the publication will be delayed until the following morning, the 16th. In future a volume will comprise a year's transactions.

The enunciation of a new principle in photography is an event of somewhat rare occurrence. It was not surprising, therefore, that the reading of Mr. Wharton Simpson's paper "On a New Method of Printing, and the Preparation and Use of Collodio-chloride of Silver," produced an amount of interest at the last Meeting of the Society with which the members have been for a long time unfamiliar. The principle which underlies the process—the possibility of suspending chloride of silver in collodion in such a fine state of subdivision as to constitute something very nearly resembling a solution—was, in itself, a chemical fact so unexpected as to excite the surprise of every one—the chairman's remark of surprise, interrupting the speaker when he enunciated the fact, being the common expression of the feeling of every member present. The application of this discovery has been in every respect as successful as the fact is novel. As specimen after specimen of portraiture and landscape, illustrating every phase of photographic excellence, and every variety of tone, was exhibited, the surprise of the members fairly gave way to admiration, and found its expression in the applause which greeted Mr. Mayall's remark, that he had not seen before, by any process, such a print as that he held in his hand, which rather resembled a proof from a fine engraving by Cousins than an ordinary photograph.

The simplicity of the process moreover was, as might have been expected, a common theme of admiration, and the gratification of members on the discovery of a process of printing so perfect in principle, so simple in practice, and so successful in result, was in no measure damped by any consideration as to patent restrictions or personal monopoly—the applause elicited by Mr. Robinson's allusion to patents was a sufficient index to the feeling of the meeting on this subject—the process being announced as presented to photographers at large as common property, unfettered by restrictions of any kind. The late hour at which the meeting was held—immediately preceding our going to press—prevents us entering into detailed comment on the process itself, or on the pictures exhibited; and we therefore simply content ourselves, for the present, with congratulating our readers on the discovery, and on the fact of the Photographic Society of London having been, as indeed it ought to be, the medium for placing before the world, for the first time, a distinctly new method of printing, illustrated with examples which, even in the infancy of the process, compare favourably with the best specimens of printing by methods perfected by the experience of many years.

PHOTOGRAPHIC SOCIETY OF LONDON.

Ordinary General Meeting.

King's College.

Tuesday, March 14, 1865.

J. Glaisher, Esq., F.R.S., V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following gentlemen were elected, by ballot, Members of the Society:—

Viscount Hawarden, Princes Gate.

Thomas Sopwith, Esq., F.R.S., 103 Victoria Street.

George Dawson, Esq., King's College.

Mr. Cooper, Jun., read the following paper:—

On the Wöthlytype Process.

I wish, this evening, to direct your attention more particularly to the *toning* of the Wöthlytype prints, as that is the part of the process which offers the most interesting subject for research, on account of some of the extraordinary and beautiful results produced by it. You must have all noticed in the pictures I have exhibited at some of our past meetings, that there are two distinct tints in them, one being warm and the other cold. As this curious effect has been produced more or less in all the prints I have done with uranium, I was, of course, rather anxious to ascertain the why and the wherefore. At first it was attributed to the process of printing itself; I mean that it was thought to be due to the use of uranium in the way used in the process; but after a good many experiments I found that this is not quite correct, as I have produced the same effect with ordinary silver prints on albuminized paper. I am of opinion that it is due to the method of toning adopted, although it is more easily produced with the Wöthlytype than with any other process. The particular action of the sulphocyanide of ammonium has yet to be determined, and will afford a very interesting subject for some of our photographic chemists. That it has some peculiar action upon the toning properties of the gold, I have not the least doubt; for with no other toning-bath will a print go through the stages of colour that it does in this. When a simply washed print on albuminized paper, or a Wöthlytype that has passed through the acid bath, is placed in the sulphocyanide and gold solution, it at once becomes of a bright yellow tint. The colour gradually approaches a brown, then a purple, and it will proceed till the tint is a decided blue. This is only what might be expected; but now the difference occurs which distinguishes the sulphocyanide bath from any other. The blue tint becomes a purple, and at last will reach a ruby-red colour; and in prints that have been toned to this last stage I have failed to detect any silver whatever, the image appearing to consist entirely of gold. But this does not account for the two colours in the pictures, you may say. If you will refer to the paper I had the pleasure of reading before you in December, you will find that I there noticed the peculiarity in the Wöthlytype prints of the half-tone being coloured more rapidly than the shadows. I then, as I have before remarked, attributed it to the process of printing, but since find that, although it is observable in a higher degree with the Wöthlytype prints, the toning-bath of sulphocyanide confers this peculiar property upon all prints. It follows from this that almost any desired effect may be produced.

It seems probable that those prints that have been toned through the blue stage will be found to be the most permanent, as the image contains more gold than it would have done if the print had been removed from the toning-bath before it had arrived at the blue tint.

The rapidity with which a print colours depends considerably upon the negative. This is the case more or less with all methods of toning, but, with the one under consideration, is most observable.

This is proved by the following experiment:—A piece of paper was coated with sensitized collodion, divided into four parts, and each one then exposed under a different negative. The four prints were then washed and toned together; and no two of them toned alike. One refused to tone at all for some time; and when at last it did condescend to commence, it did so in a very slow and dignified manner, and proceeded in the same style till finished. Another coloured rapidly, and the two tints were very strongly marked. I have related this experiment to show that, when great discrepancies are observable in the prints produced, the different class of negative used must be taken into consideration. Sometimes prints have been met with which have either refused to tone at all, or only favoured the red tone. They have been coaxed to behave properly by placing them for a few seconds in an ordinary acetate toning-bath, and then removing them to the sulphocyanide. Although no appreciable action has taken place in the first bath, it is evident, from the increased disposition of the print to tone in the second one, that some difference has been caused by it.

Most likely some catalytic action is set up which causes the deposition of the gold to proceed rapidly and well. Those who have worked at all at electro-gilding must have noticed what a difference the most trivial circumstance will make in the character and tint of the reduced metal. I have toned many Wöthlytypes in the ordinary acetate bath, and have generally found that they have lost considerably, in fact as much as ordinary silver prints. In a few cases they have behaved the same as though they had been in the sulphocyanide, not losing at all in depth.

The following is a very good plan to reduce any argento-uranic prints that have been over-printed. After washing, place them in a bath composed of

3 grs. of bichloride of platinum, and
1 gr. of chloride of gold,

dissolved in 20 ozs. of water, and made *very slightly* alkaline. The prints are allowed to remain in this bath until they are right as regards *depth*; they are then rinsed and placed in the toning and fixing bath of sulphocyanide and gold, and are removed from it when they have reached the desired tone. Another plan, which I have found equally efficacious, is to submit them to a bath composed of bichloride of platinum, 4 grs.; sulphocyanide of ammonium, 2 ozs.; and water, 20 ozs.; until sufficiently reduced, and then tone them as in the first method. By-the-by, there is a capital dodge to remove any traces of the acetic acid from the prints before toning: it consists in placing them for a few minutes in a dish of whitening and water. I have found this plan of great use when I have been desirous of eliminating every trace of acid without rendering the print alkaline.

It is curious how people will sometimes hit upon the same idea almost simultaneously, or how one may sometimes compound a salt or arrange a process, which is either patented or a secret of the inventors, without ever having seen or heard anything of it. I have met with an instance of this myself.

I heard that Herr Wöthly used in his collodion a compound which he called Härtz oil, and I also heard that a "Photo's Assistant" had proposed castor oil as an addition to the collodion for Mr. Simpson's process. It then occurred to me to make use of this suggestion and an idea that I had, and try and compound something which should answer as well as the Härtz oil, the composition of which was a secret, and which, by-the-by, I had not used or seen. After careful consideration I made two.

The formula for the first was:—

Castor oil	2 drachms.
Canada balsam	2 ,,

Dissolved in ½ oz. of ether.

No. 2.

Castor oil	1 drachm.
Canada balsam	2 drachms.
Glycerine	2 ,,
Ether	½ oz.

From five to ten drops of either of these was added to an ounce of sensitized collodion, and great benefit was found from both. I have not yet determined which gives the most satisfactory result, but think that each will suit a different class of collodion. When I received the 'British Journal' for Feb. 24th, I was surprised to see at page 97, in the French specification of the Wöthlytype process, directions for making the Härtz oil, and to find that the composition of it was almost identical with my No. 1. The effect of adding this composition to the collodion has been to render it more sensitive, and to cause it to print much more richly and evenly. It also seems greatly to improve the physical properties of the collodion. The toning proceeds more satisfactorily, and the film shows no tendency to leave the paper. I added some to an ounce or two of collodion that was put aside as useless, and, after the addition, obtained very good prints with it. I have got over some very annoying difficulties by using it.

Also with regard to the so-called triple salt described in the same specification. In January I made several salts for experiment, and among them was one made almost the same as that described.

I had some specimens of these salts with me at the February meeting of the South London, but did not introduce them to the members, as there was plenty of other matter before the meeting.

I have said "so-called *triple salt*," as I think the salt in question is a mere mechanical combination. Although uranium and ammonium may form a double salt, I very much doubt if it be possible to form a double nitrate of silver and uranium, to begin with; and even if this were possible, the nitrates of each metal are not united in their equivalent proportions. Let me be understood: I do not say that the salt in question is not, or may not be, a triple salt, but that I am doubtful, for several reasons, of its being so. Some time back I was in hopes that I had succeeded in producing a double nitrate of silver and uranium, as I obtained a salt that was essentially different in appearance to either nitrate of silver or nitrate of uranium. But after careful consideration and examination of the salt, I came to the conclusion that it was a combination of the nitrates of silver, uranium, soda, and perhaps some other—the source of these latter being the nitrate of uranium, which was not quite pure. I have crystallized together the nitrates of uranium, silver, and ammonium in their equivalent proportions, and I will pass round a sample of the result. I will also place upon the table, for examination by those interested, some specimens of salts consisting of the nitrates of silver and ammonia, silver and uranium, and ammonia and uranium.

I do not know that I have anything fresh to say on the manipulation of the Wöthlytype, except as regards the drying of the paper. It has been found that rather a high temperature has produced a much more glossy surface than a lower one; but great care must be observed in preventing a change of temperature whilst the paper is drying, and to guard it from draughts. Should the temperature be changed before it is dry, the result will be that the surface will be mottled in places. Take care, also, that the paper is quite dry before placing it in the pressure-frame; if this be not attended to, insensitive spots of a large size will make their appearance. And then, again, the paper must not be too dry. A very good plan is to collodionize the paper the night before printing upon it.

I have made many experiments to determine the applicability of the Wöthlytype process to photographic printing on painter's canvas. I was very hopeful of arriving at a successful result, but regret to say that, up to the present time, my endeavours have not proved satisfactory. When using the process on paper, in most instances the greater part of the image is on the paper and very little in the collodion. I had hoped it would be the same on the canvas, and was surprised as well as disappointed to find very little impression on the canvas, the image being almost entirely retained by the collodion. The objection to the collodion remaining on the canvas is the danger of its cracking and peeling off in the course of time. Of course this danger is materially lessened by using a very powdery pyroxyline; but still I should like to be on the safe side, and do without the collodion if possible. If the collodion is to remain on the canvas, I think Mr. Simpson's process with chloride of silver in collodion will be the easiest to work. I have met with a difficulty whilst printing on canvas, which I have not been able to overcome. The chemicals and the necessary soaking in water have usually rendered the composition on the silk or canvas quite brittle, so that the least touch would crack it. I must also call your attention to the fact that the canvas will become discoloured in a few hours after its sensitizing, owing, I believe, to lead in its composition.

I have not tried printing on either wood or ivory with uranized collodion, but am glad to hear that some other gentlemen have proved it to be practicable, and the results very satisfactory.

I am sorry that this paper has not more novelty in it than it has, but the continued experiments upon a process are seldom very new or startling; and although I have made several new ones, the results have not been sufficiently interesting for me to trouble you with the details.

Mr. G. Wharton Simpson read the following paper:—

On a new Method of Printing, and the Preparation and Use of Collodio-chloride of Silver.

In introducing a new method of printing, I do not feel it necessary to depreciate or underrate the system already in use. The process of printing on albuminized paper now universally practised is, notwithstanding its theoretical imperfections and its occasional practical difficulties, capable of producing prints of exceeding beauty; and I believe that, when worked throughout with proper care, the results possess very great, if not absolute, permanency. Thanks to the united labour and published experiences of many able practical men, the conditions of success are now tolerably well understood, and, with good negatives and ordinary care, excellent prints may be produced with tolerable certainty.

But notwithstanding the excellence which has, by long years of practice, been attained in the system of printing with albuminized paper, it has certain admitted defects which photographers would willingly get rid of. The fact that, after the most careful fixing and washing, silver is still found in the whites of finished prints, that, in fact, albumen forms a compound with silver which none of our recognized fixing agents can entirely dissolve or remove, and that such compound is in some degree sensitive to light, is in itself a grave cause for distrusting the possibility of absolute permanency in prints produced on albuminized paper. Then the principle upon which the usual method of printing is based of necessity involves perpetually changing conditions, and consequent uncertainty in the practice of the process—an uncertainty which can only be overcome by the careful exercise of judgment by experienced and skilful printers. We have to commence with a sheet of paper impregnated with an uncertain quantity of a soluble chloride and of an organic substance capable of combining with silver. This is floated on a solution of nitrate of silver, which, after the first sheet is floated, contains an uncertain quantity of the silver-salt, plus an uncertain quantity of other matter. Every sheet which is floated changes the condition of the solution; and it is only, as I have said, by observation and experience that anything like uniformity can be obtained.

In the method I am about to describe, in which sensitive salts are all combined in one inert vehicle, no such changing conditions exist; every specific portion of the vehicle used contains a definite proportion of the salts; and the stock from which it is used is not impoverished or changed in any respect. There is no interchange of parts going forward at each step of the process. The last sheet coated from a bottle of the preparation contains on its surface the sensitive salts mixed in the same proportions as the first. There is nothing, therefore, to prevent absolute uniformity of result.

The process I propose consists in the use of chloride of silver in collodion. Chloride of silver, of course, is not soluble in alcohol or ether; nevertheless it may be held in suspension in collodion.

As this fact, although analogous to other known facts, is, I believe, a new one, which had not before been ascertained, it may be interesting to explain, in two or three words, the origin of the experiment which led to this discovery. Whilst attending a meeting of the British Association in Bath last September, in a conversation with Professor Roscoe on the subject of the photometrical experiments he had described in a paper, I mentioned to him my conviction that any measurement of actinism based on the use of paper prepared with a chloride, and then floated on a solution of nitrate of silver, must be characterized by more or less of uncertainty, owing, in the first place, to the varying proportion and character of the organic matter in the paper, and the varying strength of the nitrate bath, if two sheets were floated in succession. Professor Roscoe explained that this would probably be true in printing to the depth necessary for photographic pictures; but in the lighter tints necessary for his photometric experiments this difficulty had not, after careful observation, been practically felt. Still the conviction remained in my mind that, if pure chloride of silver, or this salt plus a definite proportion of nitrate of silver, could be used in some inert vehicle and spread on glass, more satisfactory and uniformly trustworthy results might be obtained. Immediately after my return to London with this thought dormant in my mind, I was invited by Col. Stuart Wortley to witness the manipulation of the Wöthlytype process; on seeing which the thought at once occurred to me that chloride of silver might be used in collodion. I knew the tendency of viscous solutions to hold in suspension precipitates formed therein by double decomposition. I accordingly dissolved nitrate of silver in collodion, and then added to it a few drops of a solution of chloride of sodium. The result was the formation of something like emulsion of chloride of silver in collodion. This, although, something like opal glass, white by reflected light, and perfectly translucent by transmitted light, free from any appearance of turbidity, I expected would eventually precipitate, the precipitate probably remaining in suspension only a few hours, or at most a few days.

To my great gratification, however, I found no tendency to precipitate at all, and have not in the samples prepared five months ago. My first experiment with a film of this collodion poured on paper yielded a soft grey image without vigour. On adding more nitrate of silver, vigour was easily obtained; and I have since been able to obtain every variety of condition in prints from the same negative, varying from extreme softness to extreme vigour.

I will now proceed to state a few broad details of the process, premising that, whilst I have met with considerable success in my experiments up to the present time, there is necessarily in any new process much to learn which can only be satisfactorily settled by the united efforts of many experimenters. I shall therefore, in the details I shall give tonight, content myself with describing the mode in which I have produced the specimens I shall place before you, without entering into the modifications and possible improvements of which the process is capable.

The Collodion.—To obtain the best results, the character of the plain collodion is important. The film should not be too horny, as, besides giving a degree of gloss offensive to some tastes, it is at times inclined to blister and leave the paper. It should not possess too much of the powdery character, as in that case it is apt to dry flat and dead, although such a collodion generally adheres well to the paper. Above all, it must dry perfectly transparent, without the slightest opalescence or opacity. If the film be in any degree opaque, the print will lose in brilliancy, and will, on drying, appear to have a slight film or bloom on it. Before using any collodion for printing-purposes, I pour a drop on a plate of glass and allow it to dry. If, when dry, it be perfectly transparent so that it is not easy to discover it on the glass, it will answer admirably. If it dry at all opaque or opalescent, I reject it at once. The soluble cotton most suitable for the purpose is really that best suited for giving a good negative collodion. I have not had time to institute a series of experiments for the purpose of deciding the best formula for preparing the cotton; but I have used several samples. The three of which I can speak as answering best are some prepared by myself for negative purposes some time ago, some I obtained from Mr. Blanchard, and some prepared by Mr. Rouch by, I believe, Hardwich's formula. That prepared by myself was made with mixed acids—equal parts of nitric acid at a specific gravity of 1·420 and of sulphuric acid at 1·840, the cotton immersed at a temperature of about 150° Fahr., and allowed to remain ten minutes. Such a cotton is very soluble, and yields a transparent film, neither powdery nor horny, which answers admirably. The solvents I have used consist generally of equal parts of methylated spirits and methylated ether. The portion of cotton depends much upon its quality: of some samples I find that six grains to the ounce gives a collodion quite as thick as can be well managed, whilst with other samples I can use ten or twelve grains to the ounce with advantage. It may be found desirable, with some samples of collodion, to make some addition to increase its adherence to the paper. An able experimenter, known to readers of the journals as "A Photographer's Assistant," has found great advantage from some such additions, several of which he has tried, and found sugar the best both in physical and chemical action. It is not necessary, however, to enter into that subject here.

The Sensitive Salts.—I have tried various proportions of the sensitive salts, and have, on some occasions, obtained good pictures with as small a proportion as half a grain of chloride of calcium and two grains of nitrate of silver. The proportions will necessarily vary with the quality of the negative and the character of the results desired; but with an ordinarily good negative, I have found that about one grain and a half of chloride of calcium and seven grains and a half of nitrate of silver in each ounce of collodion have given the best results as regards sensitiveness, delicacy, and vigour. With a less proportion of nitrate of silver greater softness and less vigour are obtained. With a larger proportion of both salts the paper is a little more sensitive; but no other advantage is gained. I have found here, as I have found before with the nitrate-of-silver bath, that, assuming a chloride is used one grain of which will require three grains of silver to decompose it and form chloride of silver, then for each grain three grains of nitrate of silver should be added to the collodion to produce the best results.

Various of the chlorides are soluble in alcohol, and therefore available for this purpose. I have not found as yet any difference in the results from the employment of different chlorides, except so far as some of them affect the physical character of the collodion, causing glutinosity. I have used in my experiments chiefly the chlorides of calcium and strontium.

There are various modes of dissolving the sensitive salts in collodion, but I have found the following the most convenient. In each ounce of methylated spirit I find I can dissolve conveniently sixteen grains of nitrate of silver by triturating the salt in a mortar, then adding the spirit, a little at a time, and pouring it off, until all is dissolved. I keep a stock bottle of this alcoholic solution of nitrate of silver. To an ounce of this I add an ounce of ether and the necessary proportion of soluble cotton, and then add, to a solution of the chloride in alcohol containing sixteen grains to the ounce, half a drachm, containing one grain. This is added a few drops at a time, the collodion being shaken after each addition. In a few minutes the decomposition is complete; something like an emulsion of chloride of silver is formed, with excess of about two grains of nitrate of silver in each ounce. This is immediately ready for use, and, so far as a few months' experience is suggestive, will keep indefinitely.

The Paper.—An absolute decision as to the most suitable paper will require a much wider experience than I have as yet had. I have tried various samples, both with and without previous preparation. I have used Whatman's drawing-paper, Turner's calotype paper, Bristol board, common writing-paper, ordinary *Saxe* and *Rive* paper, and the paper prepared with arrowroot for the Wöthlytype process by Mr. Sandford and by the United Association of Photography. I have obtained some good results with all; but, on the whole, I decidedly like the last-mentioned best. The chief disadvantage that I have found in using unprepared paper has only been found with certain samples of collodion, and has consisted in imperfect adhesion of the film, giving the surface of a finished print a mottled appearance. It is possible that some addition to the collodion may be found a remedy for this.

Toning, fixing, &c.—The paper having been coated, dried, and exposed, the toning and fixing may be effected in the usual manner—with this difference, that, a very much smaller proportion of the *silver* salts being present, a much weaker fixing may be used with advantage. The prints I exhibit tonight have been treated in various ways. Many of them have been toned and fixed in the mixed bath of chloride of gold and sulphocyanide of ammonium which I first recommended for uranium printing, others in the acetate bath, others in the lime, others with *sel d'or*; and some have been fixed with hyposulphite of soda, and some with sulphocyanide of ammonium. As you will perceive, every variety of tone is possible, from a brown sepia-tint to deep black.

I will now add one or two words on certain characteristics of the prints and the process, in which they vary from others.

The image in most cases appears to be entirely in the collodion-film, and not in the paper at all. In some cases where I have removed the film, there have been traces of an image underneath; and in other cases, on removing the collodion-film, a very faint image only has been found on the paper, not nearly equal in depth to that found on removing the film of albumen from an albuminized-paper print.

There is no insoluble silver-compound formed like that formed with albumen. A properly fixed and washed print by this process, when tested with hydrosulphate of ammonia, gives no indication of the presence of silver in the whites, as an albuminized print does. There is therefore good ground to believe in the permanency of these prints.

The paper prepared with the collodio-chloride is the most sensitive I have used.

The manipulations are very simple, and the materials always ready without any preparation. Should it be found on experience that collodion is not desirable in printing on a commercial scale, this is at least a process which will be found useful to amateurs and for many incidental purposes unnecessary to detail here.

The question of relative expense is one unnecessary to discuss now; but, so far as I am able at present to calculate, this is, from the economy of silver, the cheapest method of printing I know.

I do not here enter on its various applications besides that of producing prints on paper; but I may mention that I have found it excellent for producing prints on painters' canvas, on opal, glass, &c. The specimens I exhibit here have been produced under the difficulties of very dull weather, and with the limited attention my own more immediate duties have permitted me to give to lengthened experiments. I have been anxious to try the process on various classes of negatives, and, besides the prints from negatives of my own, there are some from negatives by Mr. H. P. Robinson, Mr. Blanchard, and Mr. Cooper, to whom I am indebted for the loan of them. Some of the specimens (and they are very fine ones) are by a gentleman to whom I have already referred—the "Photographer's Assistant," whose detailed experiments will be found published elsewhere.

At the conclusion of the paper, some forty or fifty specimens, from card-size to whole plate, consisting of portraits, studies, and landscapes, illustrating every variety of tone from deep black and purple black to rich sepia and chocolate tints, were exhibited, and examined with lively interest by the members. In some instances, prints from the same negative, exhibiting the extremes of delicacy and softness, and the highest possible amount of vigour, were exhibited side by side, the great transparence of the shadows and peculiarly fine texture being very marked.

The Chairman, in inviting discussion upon the papers just read, expressed the gratification he felt in listening to the interesting details given by the writers. The remark made by Mr. Simpson with reference to the chloride of silver in solution remaining so long without precipitation was a most curious circumstance. One would have thought that the force of gravity would have brought it down within the period named. He hoped Mr. Simpson had preserved some of the solution without being moved at all, so that the result he had stated might be definitely ascertained.

Mr. Simpson said, he had had a portion unmoved for the last five or six months. In reference to the prints which he now exhibited, he might observe that his aim had been to get a variety of tone, and not uniformity. He had been testing the possibilities of the process; for it was easy to adhere to conditions which would yield any desired tone, if once found satisfactory.

The Chairman said, it was a remarkable circumstance that the Society was favoured on the same evening with two papers bearing so closely upon each other. The beautiful tints in the pictures exhibited by Mr. Cooper increased the interest the members must feel in this process, and he should be happy if any one who had had any experience in the subject would give them the benefit of his observations thereon.

Mr. H. P. Robinson said, he had had opportunities of seeing a good deal of printing carried on by Mr. Simpson's process. What struck him as one of its special advantages was, that good results could be produced from almost any class of negatives. He had seen brilliant and vigorous prints taken from negatives so weak and thin that he should have considered them worthless for ordinary silver printing; and he had seen soft and delicate results from what many printers would consider over-developed negatives. And this, he thought, was its great advantage over the Wöthlytype process, which, he believed, required a considerable amount of density in the negatives. There was another thing worth the attention of photographers. The germs of many good processes had been suggested; but these germs, being nipped in the bud by patents, had never had the chance of coming to full maturity, the public having no great interest in improving the property of an individual. The Simpsontype, he was happy to find, was given freely to photographers, without any reservation whatever; so that whatever they could make of it by experiment belonged to themselves as common property. The credit of the discovery and the thanks of photographers belong to the inventor; the profit to the public.

Mr. Simpson, in reply to an inquiry, said he had used alcoholic solution throughout. He had on one or two occasions, when he had found it desirable to add more silver to the portion already made, used a very concentrated solution of nitrate of silver, without much altering its physical conditions.

Mr. Cooper said, he had, within the last month or two, been making many experiments with this process of Mr. Simpson's, and at the first he got very much better results than recently. The difficulty he had experienced was the blistering of the collodion-film, and also a slight want of transparency in the shadows when the tints were dry. By examining one of the prints produced, it would be found that, on holding it so as to catch the light at an angle, the whole of the surface was dimmed, and the shadows had a cold blue over them. He had, however, no doubt that when the process came to be worked out a little more, and the minor details improved, it would prove a great boon to all amateurs. There were slight objections to it on a large scale; but if a few little manipulating difficulties could be got over, it would be just the thing for those who had only to produce a small number of pictures. Another advantage it possessed was, that it produced no dirt on the fingers or clothes, which it was almost impossible to avoid in the ordinary printing-process.

Mr. Mayall said, he should like to ask Mr. Simpson whether he had tried the experiment of giving his process a dose of castor oil. He also wished to know whether he had tried sulphide of potassium before fixing. He was happy to bear his testimony to the value of the new process which had been presented to the Society; and he felt it due to Mr. Simpson to say that, by whatever process the print he held in his hand had been produced, it possessed a degree of excellence in the shape of positive-printing which he had never seen before. Of course, with reference to a subject so new, and coming upon them as this did for the first time, they were not able to discriminate its peculiarities so maturely as they would be in a position to do after a few days, when it had been more carefully considered. On the subject of the Wöthlytype, he would observe that those who had tried experiments with it must be fully aware of the great amount of uncertainty which had existed to the present time in producing uniform results. By Mr. Simpson's, the film of the collodion being much finer than any kind of paper, and the image being in the film, a great amount of middle tint and detail in the printing could be obtained—because the film itself had a certain amount of thickness, and through the whole of that thickness the action of the light would take place. Looking at the subject casually, he should be inclined to think that the extension of the fixing-power would be very materially increased—that is, that a considerably longer time might be allowed in the process of fixing without impoverishing the print. He suggested that trial should be made with a weak kind of cyanide to finish off the negative. He had no doubt that this process would bear fixing with a weak cyanide of potassium after it had passed through the sulphocyanide, and if so, they would arrive at greater brilliancy. This subject, he was sure, would at once receive from the photographic public, not only in this country, but also in France (where all questions of this kind were taken up so vigorously), an immense amount of attention. And he had no hesitation in saying, from the specimens now exhibited, that the Society had to congratulate Mr. Simpson, who had shed an honour upon the meeting by bringing forward in so disinterested a manner a process so new and so interesting, involving, as it did, so many fresh chemical inquiries, which were as yet so imperfectly understood. He ventured also to suggest that, in any experiments which might be conducted, a variety of highly complex oils, rich in hydrogen, should be tried, as the kind of substances more likely than any others to add brilliancy, certainty, vigour, and toughness to the film of collodion. No doubt, on application to some of the photographic chemists, they would be able to recommend a series of substances highly valuable for the purpose. He thought that, as a number of chlorides could be impregnated with the collodion, it was most essential that the whole range should be gone through—not only the earthy salts of the chlorides, but the whole of the metallic series. He had been much struck, while the paper was being read, with the fact of the small amount of silver used—about seven grains per ounce. If the result of experience should be that greater perfection of result by this process was obtained, there was no question as to its being employed commercially.

Mr. Sebastian Davis said, he believed the process would commend itself to experimenters, inasmuch as they themselves could prepare their own paper throughout, and would be thoroughly conversant with all the materials used during the preparation of their positive prints. This was a point of great interest to every one, because in this way they could trace out the particular difficulty which might interfere with obtaining uniformity of tone, density, and permanency.

Mr. **Williams** said, the real use of castor oil was to make the substance tenacious, and prevent its shrivelling. He wished to know whether the white, milky collodion, a specimen of which was exhibited by Mr. Simpson, would blacken when exposed to light, or would remain permanent as it now appeared.

Mr. **Simpson** said, he had not exposed it to light, conceiving that the effect would be, that it would blacken.

Mr. **Cooper** said, he knew that it did blacken, from the fact of some in his possession having become exposed.

Mr. **Simpson**, in reply to an inquiry, said he thought the sooner the paper was used, after being prepared, the better; but he had used some after the lapse of a week, which had not lost its sensitiveness. In reply to a further inquiry, he said it was difficult to state, in figures, how sensitive it was; but his impression was, that it printed in one half the time that albuminized paper required for the purpose.

Mr. **Cooper** asked whether the prints did not lose more in tone and tint than those of albuminized paper.

Mr. **Simpson** said, he found they required almost entirely the same treatment in toning and fixing.

Mr. **Cooper** said, in his own experiments he found that the more he increased the quantity of chloride in the collodion, the more they lost in tone.

Mr. **Mayall** said, that would be stopped entirely by the sulphite of potassium. He had found that, if not washed in that before they began, they did lose considerably. A very feeble solution of not more than one-tenth of a grain to an ounce of water would enable them to get rid of the difficulty which Mr. Cooper referred to.

Mr. **Simpson** said, with regard to the use of castor oil, he had made one or two experiments, but he could not say that he had carried them out to any extent. The only difference he found was, that the physical character of the collodion was altered; it was made more tenacious, and more adherent. It was quite possible, he considered (but he had not tested it sufficiently to speak definitely on the subject), that it might supply something that formed an organic compound with the silver. Reference had been made to the use of citrate of silver; he had not tried it himself, but he had been in correspondence with some persons who had done so with decided advantage. His special aim hitherto had been to get the best results by the simplest means; and he had striven, therefore, at the obtaining of vigorous prints with the simplest collodio-chloride of silver and nitrate of silver. If these failed, he should necessarily apply himself to the use of organic compounds; and it was quite possible that these might be worth experiment. He had not on this occasion brought any specimens which he had obtained by other means, simply because he wished to speak of the process in its broadest and simplest outlines. He had not met with any example like that referred to by Mr. Davis, of the image sinking into the paper. In almost every case the image had been in the film of the collodion; when that film was removed by cracking or otherwise, he had sometimes found faint traces in the paper of the deepest black of the image, but in other instances no trace whatever. One remarkable fact, well worth pondering over, was, that he had obtained a good vigorous picture with collodion in which there was only half a grain of soluble chloride. With two grains of nitrate of silver in an ounce of collodion, a sheet of paper 22 by 18 might be coated sufficiently, whereas in the ordinary albuminized paper about 50 grains of nitrate was absorbed by each sheet.

The **Chairman** said, he did not think he ever rose with greater pleasure than he did on the present occasion to ask the Society to give a vote of thanks to those who had read the papers. When the first Wöthlytype was laid on the table, a strong desire was felt to know something more upon the subject, and great disappointment was experienced because there was no discussion. The Society had, however, gained something by the delay. He did not say that Mr. Simpson's process would supersede the Wöthlytype; it would certainly be a valuable adjunct to it. In every respect, both Mr. Cooper and Mr. Simpson had a strong claim upon the Meeting for the expression of their cordial thanks, and he had much pleasure in proposing that such a vote be presented to them.

The motion was put, and carried unamiously.

Mr. Ross exhibited his large-angle doublet, and explained its advantages. The size of the plate covered by it was 8 × $4\frac{1}{2}$ in.; the smallest stop was equal to $\frac{1}{40}$th of its focal length, and the largest about $\frac{1}{14}$th.

Mr. **Dallmeyer** exhibited some fine photographs, just received from Paris; they were by Messrs. Ferrier and Jean Renaud. The larger ones were taken with his No. 6 triple lens, the smaller with his No. 4. They were perfect in every detail.

On the table was placed a series of beautiful photographic reproductions of engravings from Turner's pictures of England and Wales; the copies by C. C. and M. E. Bertolacci.

The **Chairman** announced that the Committee of the approaching Dublin Exhibition were now advertising for tenders for the exclusive right of photographing the interior of the building; also that the French Photographic Exhibition was to commence on the 1st of May, and Members should lose no time in sending their contributions, in which he trusted the photography of this country would be well represented.

The Meeting was then adjourned until Tuesday, April 11th.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

Fourth Meeting

held in

The Society's Hall, 117 George Street,

February 14, 1865.

Sir David Brewster, K.H., President, in the Chair.

The Minutes of the preceding Meeting were read and approved.

Mr. James G. Tunny then read the following communication:—

New Collodion Printing Process, applicable to Vitreous, Enamelled, and other Surfaces.

I do not know, all things considered, if I have selected the most judicious title for this paper, knowing that it is hardly possible, when there are so many anxious experimenters at work, to produce anything entirely new; for in all probability many have been working in the same direction, and perhaps a number of these may have actually wrought out for themselves what I may consider new in this process. But even at the risk of being told that there is nothing new—very probably informed that the whole has been previously published—I will venture to introduce to your notice, under the above christening, the process that I have the honour to lay before you this evening.

In one sense, it will not be altogether new to some members of the council of our Society, as Dr. Walker and others were initiated into the secrets, if I may so call them, by which those transparencies, during the last three or four years, and prints upon enamelled glass were produced, that I have had the pleasure of laying before the Society. And now, in order that the photographic public may have the benefit of my experiments, so far as they have gone, I have acceded to the request of our Secretary to give the details of the process in this paper this evening.

In the session of 1857, I read in a paper to the Society the details of a process by which very beautiful positives and transparencies were produced in the camera and by development. Those pictures were named, for want of a better term, vitro-heliographs. Within the last few months this process has been renewed under different titles, some of them more difficult to name than even the above. Very beautiful results, no doubt, may be produced by the process I formerly described, and for some purposes it may still have its advantages; but, strictly speaking, it was not a printing process.

The specimens of my new process upon the table have been printed exactly in the same way that an ordinary plain or albuminized print is produced; only, instead of being printed on an albumen-, they are printed on a collodion-film. The first requisite is the producing of a collodion specially for this purpose. We have always been accustomed with the name of iodized collodion; now we will become familiar with chloridized collodion; and I have no doubt, if it is as answerable for positives as the former has been for negatives, that the commercial and photographic value of this new preparation will be quite as great. After many modifications and trials of nearly all the soluble chlorides, I think that the chloride of cobalt is the best of the many that I have subjected to experiment. 40 grs. of the chloride of cobalt to 1 oz. alcohol gives a definite strength of solution. 2 drachms of the above, added to 6 drachms of plain collodion, gives a chloridized collodion of the strength of 10 grs. to 1 oz. A considerably heavier chloridized collodion may be used, by the strength of the nitrate bath being proportionately increased. Ordinary collodion is what I have used; so there is no necessity for me giving any particular formula for its manufacture. The chloridized collodion seems to have the property of retaining all its qualities for a lengthened period. I had a considerable quantity made before I went away to the East, about two years ago, and I found on trial, the other day, that it is as good as when it was made. Here is a sample, which, you will see, is of a beautiful blue colour. Now, if we take a sheet of opal glass or patent plate, thoroughly clean it with a little nitric or sulphuric acid, then wash with water, and without drying pour over its surface a quantity of albumen diluted with ten times its bulk of water, containing 3 grs. of chloride of ammonia to each ounce, and allow it to dry spontaneously or by artificial heat, any number of these may be prepared and kept in stock.

To make the plate ready for printing, collodionize it with the chloridized collodion in the same manner as an ordinary collodion plate; when set, it is dipped in a nitrate-of-silver bath, 40 grs. to 1 oz. water, rather strongly acidulated with citric acid. When the plate is thoroughly free from greasy streaks, drain it, and then thoroughly wash it under the tap. It is better, however, to have an arrangement to dry it artificially, if time be of importance.

It is now laid on the negative and printed in the usual manner; the time of exposure will be somewhat shorter than that for an albuminized paper print would be from the same negative.

The printing may be examined from time to time, as this can be done without the slightest chance of moving either negative or positive plates, by using the printing-frame I have invented for this purpose.

Here is the frame, and the gentlemen present, by examining it, will see the simplicity of the arrangement, and the accuracy of the results obtained thereby. When the print is fully up, it can be slipped from its position by the point of a penknife; and the toning may be done before or after the fixation in the hyposulphite-of-soda bath. Of course the toning will only be resorted to if the colour is wished to be changed. It may sometimes happen that the print may be removed before being fully printed up, for want of time to allow it to be so; in such circumstances, if the plate has not got diffused light before exposure in the printing-frame, all that is required to give it the full intensity is to place it in a bath of pyrogallic, about the strength of 2 grs. to 1 oz. of water. The picture has to be narrowly watched; and whenever it is fully developed it should be taken and rinsed in water, and can now be toned and fixed, or fixed and toned, as above described. And as it may also sometimes occur that prints which have been fully printed, or thought to be so, may yet, after being fixed, be thought rather deficient in vigour, they also may be brought to any intensity by being placed in the above-mentioned pyrogallic bath; so that no prints need be lost but those only which by accident or neglect have been thoroughly over-printed. Even these can be turned to a purpose, as they make beautiful transparencies. All the particular effects produced in ordinary printing can be obtained by this process: it is admirably adapted for small lockets, brooches, &c., as the whole grinding and shape of the plates can be effected beforehand; and if the present novelty becomes fashionable, of cementing a disk of white glass to the surface, Mr. Forest will in all likelihood manufacture various sizes of ovals of opal with corresponding sizes of white glass for this purpose. But ultimately I am in hopes that our watch-dial enamellers will direct their attention to this, and produce plates such as our old Daguerreotype plates, having an enamelled instead of a silver surface; this would get quit of the fragility of glass. Perhaps something better than either of these will be produced, especially for the larger-sized pictures, such perhaps as thin sheets of vulcanite covered with white enamel; but of course, whatever preparation may be used, it would require to be impervious to the liquids of our sensitizing and fixing baths. I have no doubt that all our fears of want of stability arise from the bibulous structure of our ordinary paper: when this is destroyed by varnishing or waxing the prints, I believe that absolute permanency is secured.

From one particular application of this process I anticipate, in the hands of some of our composition friends, such as Mr. Robinson, some wonderful results. For example, two or three negatives could be used in printing a composite picture on a thin opal glass as if on paper, but with this advantage, viz., after the picture was finished (which need not be of a large size), a negative could be taken the size or sizes desired, by one of the many amplifying processes, such indeed as the one that has produced these beautiful specimens before us. The landscape-photographer will also take advantage of this, and by double printing give us the beautiful effect of natural sky—a desideratum that has long been wanted in this department of our beautiful art. See what a a charm these small instantaneous views by Wilson and England have; and by this process we could have small negatives, say 7 × 5, printed as I have described, and these could be enlarged by three diameters, which would give us a picture 21 × 15 inches.

The picture by this enlargement would lose little or none of its original sharpness, and by these means we could reduce the bulky and unwieldly traps which we are forced to carry about with us at present. I believe photo-diaphanie will also receive an impetus from this process, from the ease with which positives can be printed upon polished opal glass, and the readiness with which they can be removed in order to ornament vases and other ornamental objects,—all that is necessary being to print the picture as I have already described, only omitting the first application of the thin albumen-film, then to pour over the finished print a warm solution of gelatine, and after it is dry (by the by, it is well to put a few drops of honey into the gelatine, to render it a little more flexible; for without this it has a little tendency to crack in the after handling). The surface is now covered with a coating of plain collodion, and when quite dry the picture is easily removed by passing a knife round the edge, the film being carefully lifted up. It may now be cut to any form or size that may be required. The collodion coating may be dispensed with; and when so, no varnishing is required to lay down the picture, the surface only requiring to be damped to give it sufficient adhesiveness to adhere to the object to be ornamented. The exposed surface will of course have to be protected with a varnish. In order to print on a convex surface, it is necessary to fall back on some other means of printing than our ordinary printing-frame; and to attain this end I cover the frame with a thin sheet of india-rubber. Of course for this purpose the negative must be removed from the glass; this can be easily done in the same manner as I have described for lifting the positives for photodiaphanie purposes. The lifted negative is now placed upon the surface of the stretched film of india-rubber, and the prepared positive convex plate is now placed in contact with the negative, a continuous pressure being kept up. By the flexible yielding of the negative and india-rubber, the result is a print as perfect as if it had been printed upon a plain surface. By the use of this printing-frame an inequality of surface is a very slight inconvenience. I believe positives for the stereoscope, magic lantern, and for enlargement, will be produced by this process of a quality that has not been attained by any published process that I am aware of, as we have the entire power of modifying or increasing effects as in ordinary printing.

Mr. Tunny exhibited a number of specimens of his new mode of printing, which were greatly admired, especially a portrait of the late President of the Royal Scottish Academy, Sir John Watson Gordon.

Professor George Moir said that he had great pleasure in proposing a vote of thanks to Mr. Tunny, for his very important communication. We could all judge for ourselves of the extreme beauty of the results produced; and he had no doubt, from the details given, that the pictures printed by this process would be permanent—a feature of the greatest importance. The numerous applications of this new art, as explained by Mr. Tunny, he had no doubt were only the germs of many more that would arise out of it.

The President complimented Mr. Tunny for his great liberality in giving his valuable discovery freely to the world, in place of securing it to himself by patent, as he might have done. Sir David Brewster read an extract from a letter he had received from Herbert M'Leod, Esq., President of the Royal College of Chemistry, London, in which he said:—"I am not aware that you have made any experiments with the light emitted by the combustion of a mixture of nitric oxide with the vapour of sulphide of carbon. I enclose you two primitive attempts which may interest you, which were made by my friend, Mr. A. W. Gilman, formerly an assistant here. The experiments were done on the spur of the moment, in a dark stable, and without all the precautions which they deserved. One, you will see, is the photograph of the cylinder at the moment of explosion; the other was made to try if the light were capable of illuminating other objects sufficiently to produce an impression on the sensitive plate. In this experiment, however, no attention was paid to the focusing of the lens, which accounts for the indistinctness of the picture. I should state that these positives were printed from negatives on glass, procured by the wet-collodion process."

Mr. J. H. Dallmeyer, of London, at the request of the Secretary, exhibited specimens of enlarged photographs taken by Dr. Van Monkhoven. They consisted of a series of portraits and architectural subjects, in various scales of enlargement, up to about three feet, yet retaining both delicacy and sharpness of detail combined with great artistic effect. They were considered by the meeting the finest specimens of enlarged prints that had ever been exhibited.

Mr. W. D. Clark, of Merchiston Terrace, exhibited and explained to the meeting a printing-camera for wet collodion, suggested by Mr. Sidebotham, and an enlarging-camera—both cameras made for him by Mr. Rogerson, of Manchester.

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On the Glass Room and Portrait Camera.

By Thomas Sutton.

(Paper read before the Photographic Society of Scotland on March 14th, 1865.)

Mr. Chairman and Gentlemen,—The great development of photographic portraiture, and the great importance which that branch of photography has assumed as compared with all other branches of the art, render it unnecessary for me to offer any apology for the subject which I have chosen for my paper this evening, viz. the Construction of the Glass Room and of the Portrait Camera. The chemical processes employed for taking portraits have now been brought to a very high state of perfection, and it must be a matter of regret to every reflecting person that, with such excellent processes and such excellent lenses as photographic portraitists now possess, so many glaring defects should still be seen in their productions — defects which appear to me to be attributable chiefly to general inattention to right principles of construction of the glass room and of the portrait camera. I trust that you will all agree with me, and that I shall not hurt the feelings of any gentleman present, when I say that photographic portraits, as a rule, are much less perfect and less artistic than they ought to be, —that they very rarely do justice to the sitter, —that the expression is commonly unpleasing —the eyes like anything but what eyes are known to be, and even the vaunted resemblance to the sitter, in a multitude of cases, very questionable. Some amusing instances of the truth of this latter remark I will relate, as having come under my own observation. I was perfectly familiar with the countenance of your respected President, Sir David Brewster, through at least half a dozen photographic portraits which I have seen of him, when one day he was pointed out to me in *propria persona* as a visitor to the Exhibition of the Photographic Society. I should not have known him in the least for the original of any of the photographic portraits I had seen of him, or even of one which was then hanging upon the walls of that very Exhibition. Again, when I was at King's College Mr. Hardwich left behind him a negative of Major Russell, from which I took several prints. The portrait was upon a whole plate, and the idea conveyed was that the gallant gentleman was a very austere dogmatic little man, with grey hair and whiskers—one, in fact, under whose rule, whether military or otherwise, it would be an infliction to be placed. Judge then of my surprise on making the acquaintance of the gallant Major the other day to find him above the middle height, with hair, no matter of what colour, but certainly not grey, and a very jolly fellow. I was similarly deceived in Mr. Taylor, whom you all know as an old member of your Society, and now one of the editors of the 'British Journal.' He and I had known each other for some years through our respective cartes; but we neither of us recognized the other when we met for the first time, the other day, in Mr. Ross's office. Mr. Taylor I had always regarded, from the evidence afforded by his photographic portrait, as a little pale-faced fat man, with very large square shoes, and probably a shuffle in his walk. He turned out to be a very tall rosy-faced man, and neither fat nor shuffling. What he had thought of me was evidently quite as wide of the mark; and he did not hesitate to confess his surprise. I have often wondered whether the world-wide celebrities, whose cartes one sees in one's own and everybody else's album, are as unlike their photographic portraits as one's own friends are often known to be. The question assumes quite a serious aspect when we reflect upon the permanent prints of the notabilities of the present day, which are to be handed down to posterity in Swan's or Pouncy's carbon. Query, is it not morally wrong to go on thus deluding one's fellow-creatures, not only of this but of all succeeding ages? And yet if people will knowingly go, as they do, into hot, short, glaring glass rooms and be taken,—with the results of such a practice staring them in the face in nearly every photograph they see,—why then, I can only say, on their own head be it, and posterity must take the consequences.

I am surely not exaggerating the case a bit. The evils which I describe exist, and it ought to be a question of the first importance to every professional portraitist to ascertain whether his glass room is properly constructed, and whether his mode of posing and exposing is the best possible.

Too much importance is, I think, attached, in the first place, to a good business locality, and not enough to the aspect of the studio and the general conveniences for work. A first-class photographer need not surely confine himself to Regent Street or Princes Street, if the aspect of the room in that locality is objectionable. M. Silvy and M. Joubert probably do as much business at Bayswater as most of the Regent Street professionals. Who ever dreams of caring about where a great artist lives, and of making a difficulty of a mile or two more or less to his studio, or whether it be north or west of the General Post Office? A photographer who aspires to be an artist must show excellence in his work, and make the public go to him, wherever he happens to find it most suitable to his purpose to live. If a smoky atmosphere stops the actinic rays and lengthens the exposure, besides precipitating blacks upon the negative and filling the studio with a haze which veils the picture, let the photographer have the courage to tell his sitters to come to him a mile or two out of town where he can take them better. The question of the proper construction of the glass room ought never to be how to make the most of a bad situation, but how to construct the best possible room in a thoroughly suitable situation.

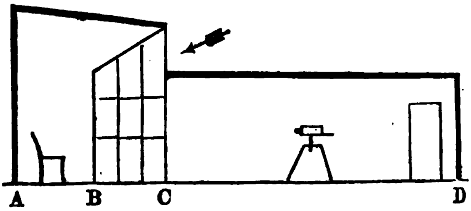
Assuming, then, that we *have* a suitable situation, what *is* the best construction of the glass room? Examine, first, the generality of photographic portraits, and then go about amongst photographers and observe the kind of room in which these portraits are taken, and I think the truth will not fail to dawn upon you. The common faults of photographs are in the eyes and the expression, while the common faults of glass rooms are that there is too much top-light, too much glare, too much light opposite the eye, too much dirty glass, and that they are too short, and have too little ventilation. A glass room is generally an uncomfortable place to go into; and no one would willingly sit in a chair in the front of the background and face the light if there were any other chair in the room unoccupied. The place of the sitter is the most uncomfortable in the most uncomfortable of rooms; how then can a photographer hope to get a pleasing expression in his picture?

But I will not go on enlarging upon evils with which you are all, gentlemen, but too well acquainted. I will endeavour to suggest a remedy, and leave it to you to discuss the merits of that suggestion, and point out the mistakes in it, if there are any. But first let me submit for your inspection four little portraits which I cut out the other day from a recent Number of the 'Bulletin Belge,' and which illustrate four different methods of lighting the sitter, viz. by a top light, a front light, a side light, and an oblique light. They are all portraits of the same person, and yet I beg of you to observe that so different are the effects of the different methods of lighting, that the likeness to the same individual is scarcely preserved in any two of them. Please observe, also, that in the case of the front lighting, the eyes are entirely put out by staring at the light, and look like two white wafers.

The type of the worst possible construction of glass room is, I think, that at King's College, as well as that of M. Claudet; in both of which there is glass all round, and a glass roof, pointed in the former case and round in the latter. The term "glass room" very properly applies to this sort of construction; and if we bear in mind that it is *not* a glass room that we want, but rather a long dark passage, we can then change both the name and the plan of the studio (the "crystal gallery," as it is sometimes facetiously called) at the same time. Let us then agree in future to call the studio the dark gallery, and remember that it is darkness, coolness, and ventilation that we want,—and not heat, glare, and a common promenade for the friends of the sitter, which is to look showy and smart. Let the reception-room be as elegant as you please; but let the studio be as it were another optical contrivance (a sort of continuation of the camera), and let it be just as ugly inside, and with walls blackened in the same way wherever blackness is required; and let us not forget that the walls of the studio are intended to keep *out* the light, and the glass only intended to keep the wind and rain from entering through those openings by which the light is to be properly admitted.

Rather more than three years ago I suggested a plan for the portrait-studio, in an article which was published in my 'Photographic News' of Sept. 15, 1861; and although I have considered the matter a great deal since, I do not yet see any reason for modifying that plan in the least. Fig. 1 is a sketch of it.

Fig. 1.



CD is a long dark passage in which the camera is placed. The walls and ceiling of this passage ought to be blackened with lampblack and glue, and the floor should be covered with black matting, everything being dead black, and with no varnish. The space BC on both sides of the room, as well as the space near the point of the arrow, should be glass. The portion AB, as well as the entire ceiling over the sitter, should be opaque, and the ceiling sloping in the way which I have indicated, and painted black in order that it may reflect no light downwards.

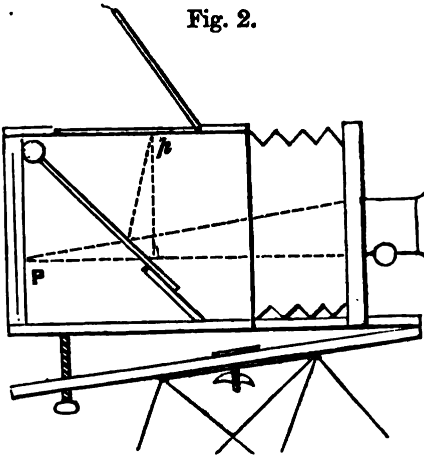
The room should have a true northern aspect, and the sitter must face the north. One of the side lights must always be shut. Whenever the weather permits, the whole of the front window must be opened, in order to reduce the time of exposure and ventilate the room. In the morning the eastern side-light should be shut and the western one open, and conversely in the afternoon, the object being to keep out the sunshine, which should never by any chance enter the room. White screens will of course be necessary at times for reflectors. The room should not be more than 8 feet wide, and its length should be at least 40 feet.

I had no sooner suggested the above plan of glass room than some of the leading professional photographers took it up, but with modifications of their own, none of which I think were good. Instead of leaving the front light perpendicular, as I have drawn it, they brought the point C nearer to D, and made it inclined, the effect of which would be, of course, to let in the sunshine earlier in the afternoon, as well as to lighten the passage, which ought to be kept dark. Besides which, these gentlemen did not seem to recognize the principle of shutting out top light, but made the ceiling incline the other way, painted it white instead of black, and allowed the front light to encroach upon it. In fact they treated my suggestion as a mere crude idea, when it was, in fact, the result of much careful consideration in every part. There are, however, circumstances under which it would be allowable to make the front light a little more inclined; for instance, if there should happen to be a very high wall at A. I need not add that the chief advantages I claim for this plan of room are, that the eyes of the sitter are directed into darkness (instead of being made to stare and blink at the light), by which a pleasanter expression is secured, and the eye better brought out; and also that the advantages due to length of room are gained without the drawback of having to take the portrait through many feet of illuminated haze, and thus veil the shadows of the picture. Even if the passage should be filled with the smoky atmosphere of a town, the smoke would not be in the light but in the dark, and would not therefore produce a light veil upon the shadows of the picture, but would merely lengthen the time of exposure. In the common form of glass room it is a great objection to having it too long, and to using long focus-lenses, that the illuminated smoke in the atmosphere veils the image upon the ground-glass, and fogs the negative.

Let us now turn to the subject of the exposure, and the arrangement of the sitter. According to the present plan, the image is viewed inverted upon the ground-glass; and that has to be removed and the dark slide put in its place, and the shutter drawn up, and the cap taken off the lens, before the exposure of the plate takes place. But this may be very simply obviated by having a mirror inside the camera, according to a plan which I described some years ago, and called a reflecting camera. The following is a sketch of it:—The ground-glass lies horizontally beneath your eye, and you look down upon it as you do at an album photograph, and see the picture erect, thus obtaining a very perfect idea of the composition, pose, arrangement, lighting, &c. Who can doubt that the constant habit of viewing the image in this way would have a beneficial effect upon the artistic character of a man's pictures, seeing that it would greatly assist him in forming a correct idea of the ultimate result? I have constantly found that an inverted image is very deceptive, and the result often very disappointing. Now, surely, considering the difficulties that lie in the way of taking artistic photographs, no chance of improving them in that respect ought to be thrown away. I believe that no amount of experience will ever enable any man, however clever, to form a correct judgment of the finished picture from an inverted image of it upon the ground-glass.

When I first suggested the reflecting camera, I placed the manufacture of it in the hands of the two leading opticians; but very few were manufactured, and at last the thing fairly fell to the ground. The chief reason was that a plate-glass reflector, owing to the two refractions which take place at its front surface, rather injures the definition upon the focusing screen, and a metal reflector became necessary; or, better still, perhaps, a glass silvered upon the face by Drayton's patent process. A metal reflector made optically true, as it ought to be, would be rather expensive, and that has been the chief reason why the reflecting camera has not come into use! Photographers have been afraid of spending a little money upon an instrument which would greatly abridge their labour in posing and exposing, and which could not fail greatly to improve the artistic character of their works. I may add that my patent for this camera has been allowed to expire, and that any optician may now manufacture it free of all restriction. I will not extend this paper by a description of the instrument, but leave it to your Secretary to explain its mode of action, if necessary, in his own words, simply observing that no black cloth will be necessary over the head of the operator whilst focusing in such a room as I have described.

Fig. 2.



And now permit me, in conclusion, to repeat my conviction that, unless some radical change is made by photographers in the construction of their glass studio and their portrait camera, the present quality of photographic portraiture, with all its glaring defects, must be considered as having reached the maximum average of excellence. Nothing better can be done, I really believe, than is now down, so long as the present style of studio and camera continue to be used; and it is only by such a complete change in these matters as I suggest that we can hope to produce photographic portraits free from the glaring defects which I have pointed out.

If I have expressed myself strongly in this paper, it is from no wish to dogmatize, but simply to call your earnest attention to what I feel to be a very important matter.

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AMATEUR PHOTOGRAPHIC TOURIST CLUB.

Having ourselves several years since devoted much time to the promotion of friendly meetings of those amateurs practising the photographic art, and remembering with much pleasure many photographic excursions taken by the members of an archæological photographic club, we have much pleasure in drawing the attention of our readers to the following rules, just issued, of the

"Amateur Photographic Tourist Club."

At a meeting held on Friday, March 3rd, it was unanimously agreed,

That it is desirable to form a club of amateur photographers, to be called "The Amateur Photographic Tourist Club."

That the objects of the club be to hold meetings in the country at least once a month, from April to September inclusive, for photographic operations. That during the six months from October to March inclusive, the club hold monthly meetings for the exchange of specimens, for conversation, and general information on photographic matters.

That every member produce not less than six large or twelve stereoscopic negatives annually.

That one good print from each of the six or more negatives taken by members during the outdoor session, be placed on the table of the club, or forwarded to the secretary, on or before the indoor meeting of the club in October.

That the prints are to be handed-in mounted, with the name of the member, the process and lens employed, written on the back, to be placed in the folio of the club as a record of the season's work.

That the annual subscription be 10*s*.

That gentlemen be elected by being proposed and seconded at any meeting of the club, and elected at the next meeting by show of hands.

That members are privileged to introduce a friend to any of the meetings.

That the place and day for the outdoor meeting each month from April to September, be fixed at the meeting in March.

That all the meetings be held on the second Saturday in each month.

That the officers of the club consist of a Secretary, and two members to form a committee, to be elected annually at the meeting in October.

That Mr. Frank Howard act as secretary *pro tem.*

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Soirée of the Amateur Photographic Association.

One of the most interesting photographic gatherings which it has yet been our lot to record took place on Thursday, the 23rd ult., at the residence of Mr. Melhuish, 12 York Place, Portman Square. We allude to the Soirée of the Amateur Photographic Association, which was given in honour of the President His Royal Highness the Prince of Wales, who had signified his intention to honour the Association with his presence that day. The walls of the front and back drawing-rooms were hung with upwards of a thousand pictures by members of the Association; in addition to which Rosa Bonheur's great picture, "Oxen Ploughing," valued at three thousand guineas, was exhibited in the front drawing-room.

At about a quarter to six His Royal Highness arrived. He was accompanied by Major Teesdale, and was received by Col. the Hon. D. F. de Ros, Majors Russell and Durnford, James Glaisher, Esq., F.R.S., George Shadbolt, Esq., Mr. Melhuish, and other members of the Council. The first pictures which attracted the Prince's attention were two copies of original drawings by Salvator Rosa, photographed by Major Gresley; after which His Royal Highness lingered some time admiring a series of geological subjects by J. W. Rimington, Esq., who, like Major Gresley and many other members of the Association, has proved himself an artist as well as a photographer. Passing further on, His Royal Highness was much interested with some views of the Highlands, by Captain Bankhart and F. R. Barclay, Esq. His Royal Highness then examined the Prize Pictures, with which he appeared much pleased, especially with "A Misty Morning," by Baynham Jones, Esq. Mr. Chidson's composition pictures next engaged the Prince's attention, and were greatly admired; but space will not admit of our noticing all the pictures which engaged the attention of His Royal Highness. We must not, however, omit to mention some by the Countess of Rosse and Col. De Ros, which were well worthy of the attention His Royal Highness bestowed upon them. Passing from the back drawing-room into an anteroom, His Royal Highness noticed with pleasure some large Indian pictures by Captain Clarence Taylor, and was much struck with some instantaneous portraits by Mr. Melhuish, which, though hung in an out-of-the-way corner, did not escape the observation of His Royal Highness; indeed they are the most extraordinary specimens of instantaneous portrait-photography we have yet seen. Having inspected the photographs, His Royal Highness was then shown Rosa Bonheur's great picture, which had hitherto been covered by curtains. For some minutes the attention of the Prince was riveted upon it, and he expressed personally to Mr. Henry Wallis, by whom it had been kindly lent, the pleasure which the view of it had afforded him. Ere His Royal Highness took his departure, Mr. Melhuish expressed to him the great gratification which he had conferred upon the members by his visit; to which His Royal Highness graciously replied that he, the Secretary, might assure them that he had been much pleased and gratified by the inspection of their works. Thanking Mr. Melhuish for his kindness and attention, His Royal Highness took his leave; and thus concluded his visit, which had been most satisfactory, and showed that our future sovereign feels an interest in our art, which reminds us of his royal father, and which cannot but be a source of gratification to us all.

The attendance at the Soirée was exceedingly large, and Mr. Melhuish's spacious rooms were taxed to the utmost to accommodate without inconvenient crowding the number present, there being little short of four hundred; amongst whom may be mentioned the Countess of Uxbridge, Lady Taylor, Viscount Ranelagh, the Hon. L. Wingfield, J. Sopwith, F.R.S., S. C. Whitbread, F.R.S., V. Scully, M.P., Sir E. Belcher, Sir R. Carden, Admiral Manners, Col. Challoner, Alderman Wilson, Alderman Finnis, Major Russell, Dr. Wright, Dr. Critchet, Dr. Tripe, Dr. Beke, Dr. Balfour, W. Huggins, F.R.S., J. Hogg, F.R.S., C. V. Walker, F.R.S., P. Le Neve Foster, W. E. Underwood, S. C. Hall, E. G. Mullins, B. R. Ronald, P. H. Desvignes, J. C. Arkwright, H. Perigal, G. E. Wallich, James Castle, &c. The Earl of Uxbridge and Viscount Jocelyn were prevented by ill health from attending; and his Grace the Archbishop of York and the Earl of Caithness and Sir Thomas Wilson, Bart., were absent through circumstances over which they had no control, but which they greatly regretted.

During the evening a selection of classical music, both vocal and instrumental, was performed by Miss Eliza Hughes, Mr. Louis Thomas, and M. Francesco Berger; and excellent refreshments, including champagne and ices, were provided *ad libitum*. In fact, the whole arrangements were carried out in the most satisfactory manner possible.

A revolving dissolving stereoscope, invented by Mr. P. H. Desvignes, created much interest. It consisted of a large series of stereoscopic pictures, which were changed by means of clockwork, and were so arranged as to dissolve one into another. We understand that, when once wound up, the instrument will continue working for several hours.

M. Rimmel, the well-known perfumer, kindly lent the celebrated "Perfume Fountain," which first graced the bridal boudoir of the Princess of Wales at Windsor; and this, together with his "Odorator" and a number of "Rafraichisseurs," the invention of the same gentleman, caused a fragrance which was most agreeable.

In conclusion, we need scarcely add that the Soirée of the Amateur Photographic Association was a great success. It reflects great credit on all upon whom the arrangements devolved.

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AMATEUR PHOTOGRAPHIC ASSOCIATION.

On Friday, the 3rd inst., a Council-meeting of the Amateur Photographic Association was held, at 12 York Place, Portman Square, His Grace the Archbishop of York in the Chair. The Minutes of the last Meeting having been read and confirmed, the following Members and Subscribers were proposed and elected:—Lilburn Rosher, Esq., J. W. Richardson, Esq.. Wm. Jones, Esq., George Ward, Esq., H. E, Pelleau, Esq., — O'Leary, Esq., G. H. Graham, Esq., Capt. Philip Hamond, Mrs. Stone, George Macnair, Esq., J. Scott, Esq., Miss C. Filmer.

The subject of the late soirée and visit of the President, His Royal Highness the Prince of Wales, having been introduced, Mr. Glaisher said that, as the only Member of Council then present who received His Royal Highness, he congratulated the Council and the Secretary on the great success which had attended their efforts, and the honour which had been conferred on the Association by the presence of His Royal Highness as President of the Society; indeed he felt that it would be a source of gratification to the whole photographic world that our future Sovereign took so lively an interest in our art.

The Secretary stated that, upon expressing to His Royal Highness how much pleasure and gratification he had conferred upon the Members of the Association by his visit, His Royal Highness graciously replied that he (the Secretary) might assure the Members *that he had been much pleased and interested by the inspection of their works.*

The Secretary moreover stated that the soirée was very successful, that nearly four hundred persons had attended, many of whom had come from great distances, in fact from all parts of the kingdom, to be present on the occasion.

The Secretary laid before the Meeting letters from the Earl of Caithness, Sir T. M. Wilson, J. J. Briscoe, Esq., M.P., J. Walter, Esq., M.P., Ald. Sydney, M.P., W. Longman, Esq., and other eminent persons, regretting that circumstances over which they had no control prevented their being present at the soirée. His Grace the Archbishop of York mentioned how very much he regretted not having been able to attend; that he would willingly have travelled from York to be present, but that, having had to sit that afternoon as President of Convocation at York, he found it absolutely impossible. Other general business having been arranged, a discussion upon the Rules of the Association, with the view of making them somewhat more rigid and better adapted to the present state of the Association, followed, resulting in referring the matter to Mr. Glaisher to prepare such for submission to the Council at a future Meeting. The proceedings then terminated.

A. J. Melhuish, *Hon. Sec.*

REVIEW.

*Photographic Year-Books and Almanacs**.

When Bottom, the weaver, was instructing his ragged company—which was "thought most fit, through all Athens, to play an interlude before the duke and the duchess,"—he called for "A calendar, a calendar!" and ordered Quin to "look in the almanac, and find out Moonshine." All trades and professions now call for calendars; and we fear they find in most of them a considerable amount of the article which Bottom desired to find out. However, there are exceptions; and the photographic profession is very fortunate in having such an eminent one as the 'Year-Book of Photography,' with which we head our list.

A calendar is, of course, an indispensable element in an almanac; the one before us, we are glad to find, contains no useless and obsolete information about "Circumcision," "St. Blase," "Ven. Bede," and other persons and things about whom, and which we, in this nineteenth century, desire to know nothing; but has, in place thereof, artistic and photographic information, and some very useful photographic hints for each month. This is followed by a list of all the Societies, their officers and times of meeting, and a well-written and exhaustive "Annals of Photography for 1864," in which every topic of interest that occurred during the past year is commented upon, together with other matters, to which we shall presently refer.

It was a happy idea, we think, the preparation and publication of a Year-Book of Photography. In an art so rapidly progressive and constantly changing, with so many inventions and discoveries, modifications and improvements, of vital importance to the ultimate perfection of the art, an epitomized history, and accurate detail of processes, for ready reference, was almost a necessity to the literature of photography.

The voluminous and contradictory papers, suggestions, and discussions which necessarily fill the journals whilst discoveries or improvements are in progress become almost bewildering when spread over many volumes; and the immense amount of valuable information becomes literally entombed and lost to those who have little time for the searching and sifting process necessary in arriving at specific information. The Annual under notice preserves, disencumbered from discussion, all that is worth preservation, and presents it in a form pleasant to read, and easy to understand. We think it a fortunate thing, then, for the art and its votaries that the origin and continuance of such a work fell into such able hands. A comprehensive knowledge of the history of the art, and a perfect familiarity with its every detail, in theory and practice, in all its branches, were necessary to render the compilation of such a work of any value or authority; and its growth and success are satisfactory indications that these qualities have been recognized and appreciated by photographers.

It would be a somewhat difficult and lengthy task to enumerate anything like the detailed contents of the Year-Book for 1865. We find copious and intelligent descriptions of all the regularly practised photographic processes, positive and negative, wet and dry; recipes and formulæ, based upon the practice of the most able and recognized photographers; clear but brief descriptions of all the new processes and discoveries of the year; and a series of very valuable original articles, by practical men, on subjects likely to be of use in daily practice; and it is a noteworthy feature of this annual, that its advertising pages form a complete directory and index rerum of the trading representatives of our growing art.

Amongst the contributors of original matter, we find the names of H. P. Robinson, Valentine Blanchard, Walter W. Woodbury, H. Cooper, jun., J. Burgess, the editor, and some others. Here are some capital hints, by Mr. Blanchard, on photography in the field, "to be read over carefully, before taking a trip from home":—

"1. Never clean a glass out of doors (*if you can help it*), and therefore take a sufficient stock ready cleaned with you.

"2. In cleaning a glass remember it has two sides, therefore *don't forget one of them*, for you can ill spare the silver from the bath which is reduced upon the *neglected* side.

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* 'The Year-Book of Photography, and Photographic News Almanac' for 1865; edited by G. Wharton Simpson. London: office of the 'Photographic News.'

'The American Photographic Almanac,' 1865; edited by John Towler, M.D., &c. New York: J. H. Ladd.

'The British Journal Photographic Almanac, and Photographer's Companion' for 1865; edited by J. T. Taylor. London: H. Greenwood.

"3. Carry a small dusting brush in your waistcoat pocket (unless you can find a better place for it), and don't lend it for love, and certainly not for money.

"4. Carry your stock of collodion in several small bottles rather than in one large one; for it is decidedly *awkward* to break your only bottle of collodion when working a mile from any habitation and twenty miles from a chemist's shop.

"5. Before packing up your apparatus, overhaul each article, and anything found wanting 'make a note of,' or, better still, hunt it up at once; and particularly take care of nuts, screws, &c. &c., and all such small fry; for the large articles will take care of themselves.

"6. Remember that though dust may considerably increase the picturesque effects of some things—an old bust for instance—its presence is by no means imperative on photographic apparatus; indeed, the *pictures* will be none the worse artistically for its absence altogether.

"7. Don't commence packing up until all the articles needful for the journey are collected together, and in order to make 'assurance doubly sure,' mentally go through the operations involved in taking a picture, thus: begin with the plates, store them carefully ready cleaned in their box, then put aside the collodion necessary for the trip, then the bath and dipper; afterwards developer, intensifier, &c., and so on to the end; and be sure you omit no part of the operation, otherwise be not surprised some fine day to find the camera minus the lenses, the bath minus its contents, the camera minus the dark slide, &c., or some such decidedly awkward mishap.

"8. Before starting weigh out several ounces of sulphate of iron and make them into packets, the bother of scales and weights will thus be removed; for if a 20-oz. bottle be used as a stock bottle for developer, the strength will be about right for ordinary work, and the amount of water can easily be varied to meet peculiar requirement. Of course you can easily measure out your acetic acid in your developing measure.

"9. Don't be down-hearted at the sight of a cloudy morning, it is frequently a sign of a fine day; and, on the other hand, rarely trust a cloudless sky at nine in the morning; the chances are, ten to one, that it will be dull by two o'clock.

"10. A calm day is of course best for foliage if the exposure be long, but remember at such times nature frequently puts on her most insipid look, therefore be not afraid to sacrifice something of the excessive sharpness in order to obtain a lasting trace of her more varied aspects.

"11. Before you pitch your tent choose well your ground, and whenever possible protect yourself from sun and wind, and keep as far from a dusty road as possible.

"12. Never trust yellow glass, and if you have any doubt use two thicknesses. The nearer the colour approaches ruby the better for your results.

"13. Before you prepare your first plate examine well your tent or dark box, and be sure there are no pin-holes of white light anywhere.

"14. No matter how affectionately dust may cling to the side of your plate, you must separate them with all the determination of a poor-law officer. It is astounding how dust will cling for support; but don't believe in it, for it won't do.

"15. In an under-exposed picture bring out all you can in development, and don't be impatient; for if you cannot bring out detail, intensification will only make matters worse. As a rule, do not hurry development, and if needful apply several lots of developers. In an over-exposed picture, however, stop the development as speedily as possible, and in intensifying apply plenty of silver.

"16. Work with the largest stop you can afford to employ, for remember you will never get perfect atmosphere in your pictures by employing a lens with a small stop.

"17. Never *fix* your pictures in the tent, but *wash* them well. You need not then be afraid of daylight, for its influence is rather beneficial than otherwise.

"18. If you are at all short of water, do not fix your negatives until you get home; for should they partly dry, you will have a stain where the action is stopped, if the fixing operation is imperfectly performed.

"19. Remember, an artistic picture costs but little more trouble than a worthless one; therefore, use well your eyes before you begin work, for though the camera is a most obedient instrument, *you* must first *see* the picture, for you cannot expect the lens to see it for you.

"20. Unless you have an inexhaustible stock of patience, stop at home."

It will readily be seen from what we have said, that such an annual as this must become the indispensable companion of every photographer, amateur and professional, who reads the English language.

The 'American Photographic Almanac' is modelled on the one we have just noticed, except that the editor, probably to suit the taste of his readers on the other side of the Atlantic, has considered it necessary to don the cap and bells, and make his publication rather more comic than is usually considered necessary in such productions in this country.

The plan of the work is this:—A correspondent, Mr. Horace Napoleon L—n, writes to ask the editor for complete instructions in photography, to which he sends the following reply, from which it will be seen that he can combine amusement with instruction:—

"My dear Sir,—If you can shave and wash yourself before breakfast, and neither smoke nor chew; if you can make a charcoal fire, and sweep out the laboratory before six o'clock in the morning; if you do not hesitate to carry a pail of water through the street, or drag a photographic hand-cart up a precipitous declivity; if you can run with a wet plate for half a mile in five minutes, through brakes and brambles, without shuddering at the idea of rattlesnakes or black serpents; if you do not scruple to ascend or descend crags overhanging death-like abysses, without the slightest conception of your soul being severed from your body; if you can feed on crackers, cheese, and spring-water for a whole day, without any craving for city delicacies; if you can bear to see a whole tour's labour shattered to atoms in the cars, without swearing; in fine, if you are determined to make photography your hobby, I will condescend to allow you to enter my sanctum, and to partake of my instructions. You must truly be an enthusiast in the art, and earnest in the undertaking, if you wish to enjoy my friendship, and reap profit from our intercourse. A milk-and-water man is none for me; and your money I care not for; but I do care for an earnest determination to conquer difficulties, an honest enthusiasm of character in every undertaking to ferret out nature's secrets, and a soul devoid of all petty venalities. I am neither politician nor tradesman; know neither the price of potatoes nor butter, much less the value of my own knowledge; but I know how to estimate congeniality of sentiments, and to measure out information by the bushel to those who seek it in the proper spirit, which is a spirit engendered alone by the love of nature's laws and beauties. If you are of the right stamp, I will write for your instruction, and superintend in person your practical development in the most charming of all arts. Write, by return mail, your views and determination."

The result is that the editor gives his pupil a series of lessons which contain information on almost every known photographic process, from the Ambrotype and Melainotpye to the Wöthlytype and photographic ghosts.

The 'British Journal Photographic Almanac' is smaller and less pretentious than the others, and is presented to the subscribers to the journal with which it is connected. We cannot expect an almanac which is printed to give away to be so complete as others which profess to be, and are, worth the shilling charged for them. Bearing this in mind, we welcome this little annual as containing many useful tables and recipes.

Photographic Reproductions of Turner's 'England and Wales.'

The Misses Bertolacci have just completed their second series of copies of the rare engravings of Turner's works. They had formerly reproduced the 'Liber Studiorum,' the series of works conceived by Turner in rivalry with Claude. They have now given to the public the 'England and Wales,' a work well known by name, but which, from its scarcity, was almost lost to students. It consists of six parts, each part containing sixteen subjects, making, when complete, a superb volume. These ladies have done good service by this splendid gift to art. The value of the originals, the production of which Turner constantly superintended, and indeed in many cases took part in the work of the engraving, is well known to be inestimable. But that to which we have especially to call attention is the exceeding excellence of the photographic qualities of these reproductions. Nothing could be finer than the delicate appreciation of the peculiar beauties of the original engravings evinced in these copies. The negatives are very perfect, and the care taken with the printing is beyond all praise.

Preparation of Photographic Printing Plates.

I. The progress of photolithography must consist in finding all those means by which precision and delicacy are promoted. At present photolithography may be divided into two methods, that in which the image is directly transferred from the negative to the stone, and those in which the image is first produced on paper, and this then transferred to the stone. The latter method is the more practical; it has many important advantages. The image is correctly transferred from the negative to the transfer-paper; it is then inverted upon the stone, and a correct image is obtained in the impression. The stone is only used when a good image on the transfer paper is obtained; and thus the tiresome repolishing of the stone is avoided, which is needed when a good result has not been obtained. The lithographic ink is directly brought upon the stone; while according to the other method, the stone is first prepared with bichromate of potass, gum, gelatine, &c., which renders it more difficult to obtain middle tints, and lessens the duration of the stone.

It will be useful to discuss, at once, the objects at which the photolithographer must aim in order to perfect his art. He must understand that photolithography differs from photography in so far, that the latter is to be attacked in a more exclusively mechanical manner, the former both artistically and mechanically. Further, that he must be conversant both with photography and with lithography—that he must be a lithographer as well as a photographer. A fit state of the negative is of prime importance; and this is of greater influence in photolithography than in ordinary copying, since all defects and irregularities appear more prominently, and therefore more unpleasantly in the impression from the stone than in the photographic impression: if the black parts in the negative which give light on the stone are too opaque, the half tints are lost; if they are too transparent, there is too great uniformity. Hence a perfect negative must be obtained. In transferring the photograph to the transfer-paper, two methods must be distinguished. The paper prepared with gum-arabic and bichromate may be covered with printers' ink, and this removed from the unexposed parts by washing with water; or the ink may be put on when the bichromate is dissolved. The latter method has the advantage, since in it the covering with ink is not left to mere accident, but may be done with artistic taste. The first method seems only intended to reproduce lines, while the second is better for half tints. It is of importance, too, whether the lithographic stone is soft or hard—whether it has to be polished with pumice or with sand; this must be investigated not only in general, but for each special case.—*Photogr. Archiv*, April 1864.

II. *Photolithography.*—Marquier covers the lithographic stone with a mixture in equal volumes of a thick solution of gum-arabic and water saturated with chromic acid (bichromate of potass?), and rubs it dry with a fine pad; then in the dark he fixes the positive with the picture on the stone, exposes it and pours caustic potass on the stone, which is allowed to act for a minute or longer, according to strength. After allowing this to drain, the surface is washed with a sponge soaked with soapsuds or something similar, which, after a minute, is washed off with a soft cloth and the stone gummed as usual. The stone is left for a quarter of an hour, laid on a suitable surface, washed again with water, and again gummed.—*Deutsche Industrie-Zeitung*, 1864.

Joseph Lewis's Method.—A jelly is prepared from 4 ounces of water, an ounce of gelatine, a drachm of glycerine, and bichromate of potass till it is saturated at 77° F. These ingredients are dissolved and glass plates covered with them; the coating is allowed to solidify till the surface does not hang to the dry finger, or stick to the negative plate if pressed against it. The negative is placed upon it, exposed; the gelatine skin is then placed in the dark with its surface downwards on a well-polished lithographic stone and a gentle pressure applied; the layer is then again removed; if this has been done with sufficient skill, the stone is rubbed with printing-ink, washed off with turpentine and gum-water, and then printing-ink applied in the usual manner. A positive impression ready for printing is the result. The same exposed surface can be transferred to several stones, and furnishes a good number of impressions from a singl exposure.—*Photogr. Archiv*, 1864, p. 36.

III. *Photographic Etching*, by E. Placet.—In order to give to the photolithographic impressions the half tints which are wanting in those produced in the usual way, various methods may be used. A copy is taken from the negative upon glass; a delicate layer (asphalt for instance) is poured upon the image itself; it is exposed to the light, the glass uppermost, and the image is immersed in the solvent (naphtha or benzole). The parts rendered insoluble by the light form elevations which correspond to the amount of transmitted light. The relief is renewed, and a galvanoplastic impression is taken from it. Asphalt gives great delicacy, but only little relief. A mixture of bichromate of potass or ammonia with gelatine is better. If, after dissolving the parts left soluble, the relief is not sufficient, it can be increased by pouring a new sensitive layer, and proceeding as before. A paper picture may also be taken which has been previously made transparent. With asphalt the paper must be immersed in solution of gelatine, in order that the solvent benzole may not penetrate it. If the picture itself is to be used, one of the following methods may be pursued.

1. The sensitive layer is placed on a thin glass plate, on mica, gelatine, paper, horn, or any transparent substance, and exposed to the light from behind. As the coagulation proceeds from the side of the under surface, the image afterwards remains completely behind.

2. Two or more layers of collodion are poured on a glass plate, then a layer of gelatine with bichromate of potass; after drying, the edges of the gelatine are cut through; the gelatine plate comes off with the collodion. It is exposed through the collodion under a

negative. The collodion is then covered with varnish, and a metal plate laid on it. The whole is passed through the press and then the solvent applied.

3. The mixture of gelatine and bichromate of potass is poured upon a thin plane metal plate; after drying, collodion is poured upon it. It is exposed under a negative; the plate is then covered with varnish, and then with a mixture of wax and resin to 0·4 of an inch in thickness. This layer is covered with a metal plate; after cooling, the first plate is removed, the gelatine plate is inverted and treated as above. The covering of wax serves to keep the layer straight and level. The operation is simplest if any insoluble substance is taken which is rendered soluble by light—for instance, the mixture of gelatine, gum, albumen, &c. with sesquichloride of iron and tartaric acid. The image may be transferred to suitable surfaces, to be used as a reserve in etching, or it may be covered with metal by galvanoplastics.

If fusible porcelain or glass colours are brought into the sensitive layer, or these colours afterwards transferred to the relief, they can be fused into the material.

The image may be covered with a layer of printing-ink; if then the reliefs are dissolved the ink dissolves too; the drawing can be transferred to stone or zinc and treated like an ordinary lithograph.—*Photogr. Archiv*, 5th year, page 172.

The 'Standard' on Photography.

The beautiful science of photography—though sadly degraded in some of its applications—is multiplying its achievements, and daily enlarging the boundaries of human knowledge. The Photographic Society of London, established in 1853, publishes a journal of its own, and enjoys the presidency of the Lord Chief Baron. At the recent Anniversary Meeting of the Society, the distinguished President offered some very interesting remarks in reference to the photographic art, illustrative of its value in various departments of scientific inquiry. There can be no doubt that a taste for such subjects is widely diffusing itself, and that the public mind is to a great extent educated into an appreciation of topics formerly looked upon as interesting only to a learned few. Philosophy, having wiped certain mists from its own eyes, not only sees more distinctly, but speaks more clearly than in former times, when learned ignorance was wont to tickle the ears of the vulgar with "the sounding jargon of the schools." The people now, when they hear, are able to understand somewhat, and therefore are the more disposed to listen. Successive scientific discoveries carry the popular intellect forward step by step, so that our workshops, cottages, and parlours may be said in some sense to keep pace with our academies, institutions, and philosophical societies.

With a kind of glass stick—three-sided instead of round—the optical student long ago succeeded in separating the rays which go to make up the solar beam. The researches of the sagacious Newton gave to the world the simple but important discovery that "lights which differ in colour differ also in refrangibility." By means of a triangular prism Newton thus found himself able to separate the various coloured rays of solar light, producing what is called the "spectrum," or band of colours, consisting of red, yellow, and blue, with various intermediate tints, making seven in all. This analysis of the sunbeam seems destined continually to yield us fresh fruits. It was found not only that light could thus be separated into its various tints, but that certain other principles centring in the orb of day could be as it were dissected for our investigation. It was discovered that light lodged chiefly in the yellow rays, and heat in the red ones. It was also found that the rays of heat extended beyond the visible spectrum, and existed outside the margin of redness. By-and-by it was thought that the other end of the spectrum, where the blue rays abounded, possessed some peculiar and distinctive properties. At last it was discovered that a powerful chemical principle existed in the region of the violet light and beyond it—just as the heat-giving rays prevailed in and beyond the red extremity of the spectrum. The principle thus associated with the least-luminous portion of the solar rays, and now known as actinism, is found to be the source of all photographic effects, and is essentially the chemical principle of the sunbeam. A photograph is not produced by the direct action of light, but by the actinic principle which accompanies the light, and from which it may be separated. Unfortunately at present we only get the effect of light and shade in our photographic portraiture. At least the exceptions are very rare and partial. Could we succeed in reproducing colour, so as to make Nature paint her own portrait, the result would be magnificent. Perhaps there is room to hope that so great a success will be ultimately attained. But even in the absence of this desideratum photography is making rapid progress, and is laying almost every department of knowledge under some degree of obligation to this new science. As a general limner of the people's portraits, photography is a sort of social institution, encouraging domestic affection almost to the same degree as the penny post. But in the higher walks of science and of art photography is gathering abundant laurels. To Mr. Warren De la Rue we appear to be mainly indebted for the development of "celestial photography." On July 18, 1860, this gentleman photographed the solar eclipse, and to his ingenious labours we owe the discovery that there are mountains in the sun as well as in the moon—the former possessing a most stupendous magnitude. The Chief Baron, in referring to the researches of Mr. De la Rue, spoke of this gentleman's photographs as being pictures of that which the human eye could not see. As there are sounds which some persons cannot hear, so there are rays which human eyes cannot apprehend. Creatures other than ourselves may have visual organs which shall be sensitive to the invisible rays of the solar spectrum; but we can only discern them by what Sir F. Pollock designates "the eye of photography." Thus a new field of vision—so to speak—is opened to the student of nature. The telescope enables us to see that which would otherwise be too remote for observation; the microscope brings to our view that which would otherwise be unseen on account of its minuteness; and now photography is enabling us to see that which has hitherto been actually invisible. We cannot perceive the thing itself; but we can see the image of the thing—its impress and its representation. Mr. De la Rue photographs the sun "shining in his strength," and obtains an effect from certain rays undiscernible to the human eye, but which reveal important physical facts connected with the constitution of the solar orb. The Lord Chief Baron says, "This is one of the matters which, I own, I have been watching for and expecting; but I expect much more." We seem, in fact, to be on the threshold of discovery, and in its present able hands photography will doubtless be made to yield some very important results—even beyond those which have already been gained.

Photography not only soars to the ecliptic, it condescends to the minute and the obscure. About four years ago Mr. Thompson, of Weymouth, photographed the bottom of the sea! A continental philosopher has recently departed for Egypt, in order to photograph the dark interior of the Pyramids by the aid of the magnesium light—a flame richer in actinism than the ordinary daylight of England. Wedgwood takes rank as the first photographer in order of time, his "account of a method of copying paintings upon glass, and of making profiles by the agency of light upon nitrate of silver," dating from 1802. Since his day there has been a sort of perpetual progress in reference to the art which he thus initiated. It reckons among its students and experts a long and illustrious roll of names. Allied with chemistry and the microscope, it seems destined to give us what we might almost style a new sense—certainly a second sight. It has itself assisted to explain the functions of vision by instigating the invention of the stereoscope, an instrument which plays with our eyes after the fashion in which nature uses them. Thus photography not only developes itself, but helps to develope other branches of human knowledge. It is the handmaid of almost every art, and promises to become the pioneer of all the physical sciences. Originally a source of pleasure, it is daily proving its real utility. So it has been with every scientific discovery. When first a prism of glass produced as it were a section of the rainbow, the experiment might have been deemed little else than a scientific pastime. But we now find the "spectrum analysis" yielding the most astonishing results, altogether unlooked for at the commencement of the present century. The refractive power of the prism is applied not only to the solar beam, but to the light of the moon and the stars and to the rays emitted by terrestrial flames. So ingeniously are these operations now conducted, that the constituents of the bodies emitting such rays are thereby detected, and we come to learn what are some of the component parts of the solar atmosphere, and are able to detect the combinations of matter with a refinement hitherto unknown. We may be sure that, in all this intellectual progress, increasing power is obtained for the accomplishment of good and desirable ends. Science may develope new terrors in war; but far more does "divine philosophy" adorn and bless the labours of peace.

MISCELLANEA.

We understand that photographers and photographic-print sellers have united themselves into an association to protect themselves against the persecution of printsellers. In this we think they have acted wisely, and, when they have a good cause, may, by union, accomplish that which individually many might not be willing to undertake on their own responsibilities and resources.

Useful Photographic Portraits.—The 'Daily Telegraph,' referring to the National Portrait Gallery, says:—

"To make our British Walhalla truly national, we should descend much lower than perhaps the tasteful curators of the collection in Great George Street are willing to do. We should fish obscure merit out of the depths, and drag remarkable but diffident roguery out of its secret penetralia. An intelligent photographer, who set up his studio about Drury Lane or the New Cut, might in the course of a few months get together such a series of *cartes de visite* as would prove exceedingly valuable to the future historian, however they might be disregarded or condemned by the present generation. The naturalist who figures the lordly golden eagle, or descants on the form and habits of the colossal elephant, does not disdain to study the appearance and manners of the ugliest reptiles and the most disgusting vermin. It is all very well to have a collection of English "worthies"; but should the "unworthies" be allowed to depart from the scene of life without notice, and without portrayal? Have not the rogues a claim to the attentions of the camera? shall the impostors go unpainted? Are cheats, and vagabonds, and humbugs of all kinds to find no place in the Social Zoology? It would be extremely unwise to admit such a principle of exclusion."

Photographs of the Pope and of the late Cardinal Wiseman.—Letters from Rome state that there has been an enormous demand for likenesses of the Pope, in consequence of the publication of the famous encyclical letter, and from which photographers have derived much emolument. We observe that many excellent representations of the late Cardinal Wiseman are now in the shop-windows, and are freely purchased by all classes.

Microphotography.—At a recent meeting of the Geologists' Association, Mr. Highley, F.G.S., exhibited, by the aid of his oxyhydrogen lantern, a series of enlarged microphotographic objects. Our readers will recollect the beautiful specimens exhibited by Mr. Wood from the hands of Dr. Maddox, at King's College. We would recommend them to inspect Mr. Highley's extensive collection.

Glass Houses.—After all that has been written on the construction of glass houses, we find that the most practical authorities agree in thinking that the old form of "lean-to" or "ridge roof" is the best. In this opinion we entirely concur. And where a northern or north-east aspect can be procured, it is most desirable to do so. We may safely say that the majority of good pictures which we have had occasion to admire have been taken in rooms constructed on the old principle.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

Just as we are going to press, and after the present Number of the Journal has been completed, we have received a lengthened communication from Mr. Pouncy, of Dorchester. We greatly regret our inability to publish it until the next issue.

⁂ In consequence of several applications to the Editor, he begs to state he has never in any way been connected with the Polytechnic Institution, or with any photographic establishment, either there or elsewhere.

J. W. D.—The applications for space at the Dublin International Exhibition exceed in amount more than four times the quantity at the disposal of the Committee. If you write to Sir J. Jocelyn Coghill, probably you could exhibit any remarkable novelty.

Amateur.—1. We do not think you can purchase specimens of Mr. Swan's carbon process; write direct to that gentleman, at Newcastle. They are infinitely superior to those to which you refer. At the Meeting of the Photographic Society, when Mr. Swan detailed his process, he freely gave specimens to those most interested in his discoveries. 2. Write to Mr. W. M. Brown, 213 Regent Street. The Association seem to be most careful of their productions. One trivial picture, of the *carte-de-visite* size came into our possession, and that we distributed to the gentlemen whose representation it bore.

M. D. L.—The negatives from which the pictures of animals and birds were printed, taken by the Count de Montizon, were entirely destroyed. The Count informs us that he has not even retained an entire series for his own portfolio. The varnish used has in many instances led to their destruction, it having cracked and peeled off—a caution to photographers to use every care in their choice of this article.

A Member.—A Committee of the Council has been appointed to determine if a Soirée shall be held by the Society, and, if needful, to make all the necessary arrangements. The practicability of the future Exhibitions of the Society will be also considered by this Committee.

Ernest.—You will find full instructions for the process in Mr. Simpson's paper, read before the last Meeting of the Society, and published in this Number. We have very great hope that, not only the prints produced by it, but the process itself will be permanent.

J. J. C.—The pictures produced by the pantascopic camera are in panoramic perspective. Theoretically these pictures should not be exhibited on a flat surface; but the results are very beautiful.

P. Y.—When the silver solution you have kept in a gutta-percha bath begins to fog, and if a new nitrate bath put into the same receptacle also fogs if kept in it a day or two, the gutta-percha has begun to change in character, and should be set aside. Avoid gutta-percha, if possible.

Two.—We have seen some of Mr. Gill's double-imaged cards. They are taken direct in the camera, and require no "dodging" in the printing. The double image is managed with shutters inside the camera, which close one half of the plate at a time.

G. S.—Toning by the phosphate-of-soda bath is still occasionally employed; but we agree with the majority of photographers in preferring the acetate of soda.

Boscher.—Very much under-exposed. This is a common fault with beginners. It is better to give a little too long than too short an exposure. It is a good rule to expose for the shadows; the lights will take care of themselves. Thank you for your compliment; but your apologies for troubling us are unnecessary, as we have great pleasure in assisting beginners.

Aberdeen.—The gentleman in question, some years ago, wrote a number of papers (suggesting a great variety of combinations) on all processes. We are not aware that any good has resulted from his suggestions, although he has since claimed processes invented by others. We take no personal interest in the matter.

Peterloo.—Either hyposulphite of soda or sulphocyanide of ammonium might be used.

P. S. K.—We will endeavour to obtain the information; but we rather think, not.

Calotype.—See Vol. I. p. 129.

No. 156. APRIL 15, 1865.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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PHOTOGRAPHIC SOCIETY.

THE next Ordinary Meeting of the Society will take place at King's College on Tuesday, May 9th, at eight o'clock, when a paper will be read by Major Russell, "on Dry Plate Photography."

Members may now obtain the photograph of "Bringing Home the May," on application to Mr. Mattress, at Messrs. Taylor & Francis's, Red Lion Court, Fleet Street.

MEETINGS OF THE SOCIETY, 1865.

1865. Tuesday, May 9
„ June 13

IT is our duty to remind our Members and intended Exhibitors that the last day for sending contributions to the Exhibition, which opens at 9 Conduit Street, on the 2nd of May, will be on or before the 22nd of April. The Committee who were appointed to superintend the arrangements of this Exhibition have determined to make their award of Medals immediately preceding the opening; it will therefore be seen how important it becomes that no want of punctuality should take place. The Secretary will, in the course of a few days, forward a card of admission (which will also admit a friend) to each Member, for a *Soirée* which will take place on the evening of the 8th of May.

THAT there should be a bond of union, and a reciprocity of kindly feeling, between photographers, whether members of their own or other Societies, has always been the wish of the Council of the Photographic Society of London. This desire, it is hoped, will in future be carried out to a fuller extent than has hitherto been possible, an opportunity having lately occurred which has enabled the Council, in some measure, to give effect to their wishes in this respect. The North London Association having decided that this Journal should again become their organ, the Council have invited members of that body to attend their ordinary meetings, and to take part in their discussions; and it was very gratifying to the Council to see so many of their North London brethren at their last meeting. Since this decision was arrived at, it has been suggested, that if this invitation were extended it would greatly conduce to the interests of the art; and as the well-being of photography and its followers is the chief object of the Society, the Council have to announce that they would always be happy to see the members of any other Society, either metropolitan or provincial, at their meetings. It is hoped, however, that this liberality on the part of the Council will not be construed as any indifference to the extended membership of photographers in this Society; and that all to whom circumstances render it possible will extend the influence and consolidate the power of the Society by joining its ranks as regular Members.

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THE renewed vitality of the Society and the interest of its Meetings, on which we had recent occasion to congratulate our readers, seem to give promise of continuance. Rarely has it happened since the commencement of the Society, that a Meeting of greater interest was held than that of Tuesday evening last. That of the preceding month was, as we have before stated, signalized by the announcement and description of a new printing-process of the utmost value, illustrated by specimens of the rarest beauty, and of which, during the past month, the encomiums then past have been, without any exception to our knowledge, fully confirmed. The April Meeting also brought forth a new printing-process, the results of which, if less beautiful than those exhibited at the previous Meeting, are perhaps still more pregnant with economic interest. The new lens invented and described by Mr. Dallmeyer is, we imagine, destined to become *the* landscape-lens *par excellence* for all views in which a wide angle of subject is important to pictorial effect or truthfulness of delineation. The negatives exhibited showed that perfect detail and sharpness might be obtained on a 10 × 8 plate, with a lens of $6\frac{7}{10}$ equivalent focus, including an angle of upwards of 80°—which, besides being a triumph over optical difficulties, must be quite sufficient for all but extraordinary subjects, rarely to be met with, and seldom necessary to reproduce.

There was, perhaps, but one drawback to the interest of either of the novelties described: they were both patented, and in this respect stand in unfortunate contrast to the discovery by Mr. Simpson, given freely to photographers at the March Meeting.

On the subject of patents let us not be misunderstood. We by no means deny the right of the inventor to the fruits of his labour; and where, as in the production of instruments requiring the labour of the skilled manufacturer, he, by securing the protection of patent to his invention, at the same time affords the best guarantee to photographers that his invention shall be produced with the utmost care and efficiency, and be protected from inferior imitations and impudent piracies, the monopoly obtained can neither be matter of regret nor objection. Besides, photographers do not want to make their own lenses. But as in the processes of photography each new discovery or modification is so greatly indebted, both for principles and details in working out, to the processes which have been freely given to the world by former inventors, we feel it incumbent upon the Society to interpose its influence against the tendency to restrictiveness and monopoly which has, unfortunately, too frequently characterized the course of recent workers in old fields by the aid of new light.

PHOTOGRAPHIC SOCIETY OF LONDON.

ORDINARY GENERAL MEETING.

KING'S COLLEGE.

TUESDAY, APRIL 11, 1865.

J. GLAISHER, Esq., F.R.S., V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. WILLIS read a paper on

The Aniline Process of Photographic Printing.

THE few years immediately following the publication of Mr. Fox Talbot's method of photogenic drawing were remarkable for the number and variety of other photographic processes then discovered. The frequent announcement of new processes, in which both the substances and the manipulations were for the first time introduced into photography, gave to the new art an amount of interest that seems to have left it in the later monotonous years of collodion negatives and albumenized silver prints. It is true that the majority of those early processes were more curious than useful, and they soon fell into neglect. There were, however, among them a few that merited a better fate, and it was then my belief that these would eventually be brought into use. Among the processes alluded to, that known as Hunt's chromatype has ever been an especial favourite with me. In this process, paper is coated with a solution of bichromate of potash and sulphate of copper, and, after exposure to light under a drawing or other object, is immersed in a solution of the nitrate of silver or of mercury, when the picture developes of a bright red colour. Those who have practised this method know how perfectly the half-tints are rendered, and how completely the photograph is a transcirpt of the object laid upon it. It gives also a positive by one operation, so that drawings can be copied without requiring the previous production of a negative. But then everything is represented in either a scarlet or orange dress; and although such tints do very well to reproduce the red-chalk sketches of the old masters, they are inadmissible in landscapes and ordinary drawings.

Finding that these chromatype copies so perfectly imitate the original, it has long been a subject of interest and of labour to me to discover a method of altering their tint to some shade of brown or black, so as to make them more nearly resemble ordinary photographs, prints, or drawings.

My earliest attempts were confined to the treatment of the silver-developed chromatype—to the changing its scarlet hue to a black one.

The trials made for this end were almost innumerable, and extended over many years of occasional experimenting, in which, however, an interval of several months would sometimes occur between two successive experiments. It would be tedious and useless to describe the various methods adopted; a few of the most successful, however, may prove interesting. The conversion of the chromate of silver into a chloride, and its subsequent exposure to light, as first proposed by Mr. Hunt, was found to give a variety of purple and slaty tints. Immersing the picture in a solution of an alkaline sulphide changed it to a pleasing brown; but the best dark tint was obtained by placing the scarlet picture in a solution of a neutral alkaline tartrate, which whitened it; and, after drying, an exposure to light changed it to a fine vandyke-brown. One of the most curious methods adopted for darkening these pictures was that of holding them before a fire till the paper was almost scorched, when they changed to black, owing to the partial reduction of the oxides of chromium and silver. These were found to change, after long keeping, to a green colour, probably from the conversion of the oxide of silver to a sulphate, and the consequent isolation of the green oxide of chromium.

The difficulty of keeping the ground of the paper clear in these chromatypes, owing to the tenacity with which the silver-salt used in their development retains its hold of the paper, caused me finally to abandon any further attempts to get dark-coloured pictures from silver-developed chromatypes, and to direct my efforts to the discovery of a substance that would develope the picture of a dark colour when applied, instead of silver, immediately after the exposure to light. My best results in this direction were obtained by the use of the various forms of tannic acid, such as infusions of sumach, valonia, nut-galls, and catechu. The last-named gave very rich browns, and catechine very rich sienna tints. Hematoxylin, the colouring-principle of logwood, gave the darkest colour; but in all these cases the ground of the picture was much discoloured, and the picture smeary, owing to the solubility of the unreduced chromic salt in the coloured infusion.

When just on the point of giving up these researches as hopeless of successful result, my attention was arrested by the following passage in a modern work on chemistry:—"Chromic acid strikes a green, a blue, or a black colour with the salts of aniline, according to the degree of concentration of the solutions." It immediately occurred to me that, since in a chromatype picture, just after its exposure to light, the picture itself contains free or uncombined chromic acid, whilst the ground of the picture consists only of chromic oxide, if such picture were immersed in a solution of a salt of aniline, it would be blackened where the chromic acid lay, and probably not on the other parts. A salt of aniline was accordingly prepared; and on immersing a chromatype picture therein, the design changed to a fine purplish-black colour. The ground of the paper, however, was discoloured, and the design itself smeary, as in the tannin-developed pictures. This defect was partially overcome by dexterously covering the paper by a single stroke of a flat brush, leaving only sufficient of the aniline-salt to slightly moisten the surface. The citrate of aniline was found to give the best results. In order to discover if any improvement could be effected by varying the nature of the solution used for coating the paper, an old variety of the chromatype solution, consisting of the chromate of copper dissolved in sulphuric acid, was prepared; and better results seemed to follow from its use. This variety of the chromatype solution, proposed first, I believe, by Hallem, led to some important discoveries in connexion with this subject. It soon became evident that a great change of tint resulted from the varying quantities of free sulphuric acid which unavoidably attended such a method of preparing the sensitizing solution. With excess of the acid bright-green pictures were obtained—an unexpected and interesting result, as I had not until then heard of the production of green photographs. I next began to reason that the free sulphuric acid in the sensitizing solution might be made to form the requisite salt of aniline, and thus save the necessity for the previous preparation of such salt; but as aniline in its concentrated form could not be applied to the picture without spoiling it, solutions of aniline in benzole, in ether, and in alcohol were made, and the exposed pictures immersed therein. The result was as anticipated: the requisite salt of aniline was formed, and the picture developed. On removing it from the solution and hanging it up to dry, the benzole and excess of aniline evaporated. I expected by this means to be able to get pictures free from the smeariness that results from the use of aqueous salts of aniline, the chromic salts not being soluble in benzole. In this I succeeded; but the excess of aniline left the paper much discoloured. This method was therefore abandoned, and a return made to the citrate-of-aniline development. I was acquiring considerable dexterity in the application of this citrate solution by one stroke of the brush, when an accident occurred that altered entirely the mode of applying the developer. (This accident will be seen to bear much resemblance to the well-known one that happened to Mr. Fox Talbot in connexion with the calotype process.) A picture which had been quickly but only partially covered with the developing liquid was placed in a drawer to allow of its development in the dark; on taking it out again an hour afterwards, it was found to be developed much beyond the limit of the wetted portion. This was at the first glance puzzling, as it was impossible that the liquid salt of aniline could have penetrated so far by capillary action. A few moments' reflection sufficed to point out the real cause—that vapour had escaped from the wetted portion and had coloured the dry parts. A trial was of course immediately made to develope a picture by vapour alone. The bottom of a cylindrical glass jar was covered with a solution of citrate of aniline, and a chromatype picture was suspended over it. In a few minutes afterwards the picture was found to be completely developed, and that in a very superior manner. The lights of the picture were very clear and bright, whilst the design had no trace of smeariness. The latter result was to be expected, seeing that the sensitizing salts had not been brought into a state of solution.

This first experiment sufficiently established the superiority of this method of development, and for some time I continued to suspend pictures horizontally over the surface of a solution of citrate of aniline. It is surprising that sufficient aniline should escape from such a solution, especially when it contains, as it ought, a large excess of citric acid. When pure aniline was spread over the bottom of a glass dish and a picture suspended over it, the lights were always much discoloured. The aqueous acid citrate of aniline was therefore persevered with, until a dilute solution of aniline in benzole, turpentine, or ether was found to be preferable, owing to the absence of water, which, even in vapour, seemed sometimes to blur the picture. The method of using this solution of aniline in benzole was as follows:—A shallow box or tray, of the size of the largest sheets used, had two or three sheets of bibulous paper placed on its bottom; and the solution of aniline was then poured on these sheets by means of a dropping-bottle, in lines or rows of liquid about 2 inches apart. The sheet to be developed was attached by drawing-pins to the under side of a loose cover, which was then placed on the tray and rested on the broad and flatly planed sides of the box. The vapours of aniline and benzole then ascended and coloured all the parts of the picture which had not been reduced by light. Latterly it has been my custom to reverse the position of the picture and the bibulous paper, making the latter a fixture to the under side of the cover, and simply laying the picture face uppermost on the bottom of the box.

Now began a most perplexing and uncertain variety of tints—not in one and the same picture, which always developed with remarkable uniformity, but in succeeding ones when the materials or the manipulation were varied in the least degree. A difference in the colour of the finished print was produced apparently by the most trifling causes, such as changing the kind of paper used, or mixing a fresh quantity of the sensitizing liquid. The greatest defect was a tendency in the pictures either to develope green or to change to that colour within a few days afterwards. In order to overcome this defect, a most extensive series of experiments was prosecuted to ascertain what influence the introduction of various metallic and other salts in the chromatype mixture would have on the colour of the finished picture. The labour and time bestowed on these trials are regretted now, I having lately discovered that the tint of the picture depends more on the proportion of the acid mixed with the chromic salt than on the presence of a metal or any other extraneous substance in the mixture. For a long time copper was thought to be essential to the production of a fine black; but it was afterwards discovered that quite as intense a black could be produced when the chromatype mixture consisted merely of an alkaline bichromate with a little sulphuric or phosphoric acid. Later experience seems to show that the colour depends on the degree, the rapidity, and the manner in which the aniline is oxidized by the chromic acid; also, to some degree, on the quantity of free acid present to alter the colour thus produced. When the quantity of acid is extremely small, the picture will not develope at all; with a little more, it will develope slowly and of a reddish tint; with a further increase, the picture will be black; and with a still greater amount, either blue or green.

The next step was to ascertain whether any other substance than aniline could be used for development. Toluidine, when pure, gives an orange-brown tint. Commercial samples of this base develope much like aniline, probably owing to the presence of the latter as an impurity. A great number of other bases were tried, and several gave indications of colouring-power. One of these possesses the required property in so eminent a degree as to surpass aniline greatly in the intensity of its browns and blacks, and in their permanency. Not having yet completed my researches with this material, I must beg to be excused from mentioning on the present occasion anything else respecting it but a few of the valuable qualities it seems to possess. I hope a future opportunity will occur to lay before this Society a complete account of this substance, and the best mode of using it. At present it is not an article of commerce, and, I believe, has not yet been named. Its most remarkable characteristic is that of producing, in contact with chromic acid, a colouring-matter that is proof against the most violent chemical reagents. The mineral acids and alkalies scarcely alter its tint, which will therefore probably prove to be absolutely permanent. It would almost appear that the chromic acid chars the developing material to a considerable extent, and so produces a colouring-matter rich in carbon. If this should be confirmed, this method of printing will prove to be the true carbon process.

The unalterability of this colouring-matter by acids and alkalies gives us the great advantage of being able to remove all the chemicals from the ground of the paper, and to restore it to its primitive whiteness. This cannot be done with aniline development without considerably altering the tint of the picture. The alterability of aniline by these reagents is, on the other hand, some advantage, as it enables us to get pictures in very varied tints—a wash in acids giving rise to blue or green, and one in alkalies to a rose or purple colour.

A brief synopsis of this aniline process of photographic printing will now probably be acceptable. The sensitizing liquid consists of a solution of the bichromate of potash or ammonia containing a small quantity of sulphuric or phosphoric acid. This liquid is applied to paper either by sponging or by floating. When dry, the paper is exposed to light under a positive photograph or a drawing, after which it is placed in an atmosphere charged with the vapour of aniline. Finally the print is washed either in plain water, or first in weakly acidulated water and subsequently in plain water.

Advantages of the Process.

The advantages which this method of photographic printing may reasonably claim over those now in use are,—

1st. *Extreme Simplicity of Manipulation.*—The method of coating the papers and their exposure to light is the simplest possible; and the development incurs no more labour than the placing of a print in a portfolio. This development also fixes the picture so that it may be left without any washing, if the tint of the paper and a slight veiling of the picture be not objectionable. It is, however, improved by washing in plain water for about 10 minutes. The contrast this presents to the lengthened and laborious washings of silver prints is very striking, and is a matter of considerable importance, especially when large prints are done.

2nd. *Greater Sensitiveness to Light.*—The time of exposure amounts to about one-third of that of silver prints. In sunshine, copies require from 2 to 10 minutes, according to its intensity, and from 15 minutes to half an hour in diffused daylight.

3rd. *Extreme Cheapness of Materials.*—Here the advantage is very considerable, the chemicals required being of very low cost and easily procurable. This would enable life-size portraits to be issued at very moderate rates.

4th. *All necessity for Mounting is abolished.*

5th. *Facilities for getting Finished or Touched Pictures.*—In the present system of printing from *negatives*, all defects in the copies have to be remedied by touching every individual print. But by this system of printing from *positives*, a careful touching of the first positive will ensure equally finished copies in all that are printed from it.

6th. *It enables Copies of Drawings to be taken without the previous production of Negatives, and without the use of Cameras or other costly apparatus,*—all the apparatus necessary for working the process being a flat board, a blanket, a shallow box, and sheet of plate glass.

Defects of the Process.

I cannot claim to have brought this method to perfection; it would be scarcely possible for an individual to do so with any photographic process. There may be also one or more defects inherent to the method, and which therefore cannot be remedied. Fully persuaded I am, however, that its merits greatly exceed its defects.

It falls short of silver printing chiefly in the want of transparency. There is more or less of a matted appearance in the shadows, which prevents the full amount of detail from appearing. This will be overcome when a method has been discovered of keeping the chemicals on the surface of the paper. Unfortunately it is difficult to accomplish this by means of a glazing material, such as albumen, in consequence of the chemicals forming therewith an insoluble compound on exposure to light, and thus preventing their removal by washing. The formation of such a compound takes place in ordinary silver printing also, but is there an advantage, because such insoluble parts constitute the picture and remain fixed, whilst the soluble white parts are removed by washing. Although my experiments in this direction have been very numerous, the subject is far from being exhausted, and I have strong reasons for believing that this difficulty will be overcome.

One of the greatest perplexities that will be found to attach to the *working of the process* is that of exposure. This is a matter of much greater nicety than in printing from negatives, and is more difficult to judge of. The difficulty, however, is not nearly so great as in carbon printing, because there is sufficient appearance of the picture to enable one who has practised the method for a short time to tell certainly when the exposure has been continued long enough. After a little practice and working in one and the same locality, few or no failures will occur from this cause.

Some persons will reckon the necessity of procuring a positive before printing as one of the defects of this process. But this is counterbalanced by the facility afforded for retouching such positive, and thus rendering all the copies free from defects. Independently of this, the extra labour involved in printing a positive on glass by the tannin or other dry process, if such plates were kept in stock, would be so slight as to be scarcely appreciable.

Applications of the Process.

The applications of this method of photographic printing are limited to the multiplication of positives from other positives. In consequence of this and of the granulation of the paper, I believe the most extensive use of it will be the copying of drawings by engineers, architects, and manufacturers. These are generally made on tracing-paper, and are thus sufficiently transparent to be copied in this way. The commercial value of the process in this respect alone is something considerable.

The multiplication of artists' drawings is another application which will speedily be made of this process. Facsimiles of the sketches of our best artists will then be procurable, and more sought after than engravings are at present.

The copying of manuscripts, legal documents, maps, music, and writings on parchment is another valuable and extensive group of purposes in which this process is available.

In ordinary photography, I believe it will prove by far the best process for copies of life-size portraits. The granulation of the paper, so offensive in small subjects, is here an advantage, giving a texture and a degree of boldness that are suitable to such pictures.

For transferring designs to wood-blocks, it will probably prove the best photo-process; also for printing on silk.

Permanence of the Pictures.

Most persons will be ready to exclaim, after hearing how these pictures are produced, "Pictures in mauve! they will prove as fugitive as mauve-dyed fabrics!" In answer to which, I have to say that mauve is the most permanent purple dye yet discovered; and when it fades, it does not bleach out, but merely changes its tint. But these pictures have only a small quantity of mauve in their composition. The materials used in their production are the same as those employed to produce the dye, and in the production of this dyeing material the quantity of mauve obtained is but infinitesimal compared with that of a black substance that is at the same time formed. Now this black substance has been found to have extraordinary persistence of colour, so much so as to resist two or three successive applications of powerful bleaching operations. I state this on the authority of others, as quoted in scientific periodicals, not having proved the matter for myself. I have always found the aniline-developed pictures to be more changed by acids and alkalies than should be the case if the black compound formed so large a part of the colouring-matter of the picture. Still, if they are changed in tint by acids and alkalies, they are not destroyed by these agents, and when exposed to the action of light, air, and moisture only, seem to be remarkably permanent. If in preparing the sensitizing solution the phosphoric acid has not been carefully proportioned to the other ingredients and it exists in slight excess, the pictures will, as before described, develope either blue or green, or will fade to a green after a few days. Pictures that show no such tendency after a week or two, retain their tint perpetually. I have suspended aniline pictures to the walls of my laboratory for twelve months without perceiving any alteration in their strength or their colour. There is on the table the first aniline-developed picture, which was taken January 1863, and which has not lost any strength by being kept in a portfolio ever since.

Pictures developed by the new developer to which I have alluded, however, have no mauve or aniline-purple in their composition, and are little or not at all changed in tint by the application of acids and alkalies. They will therefore probably have still greater permanency than the anilitypes; and should they prove to consist mainly or entirely of carbon, such production of carbon pictures by chemical action will certainly be a novel and interesting discovery. But whether these pictures prove to be carbon pictures or not, they will unquestionably have a high degree of permanency; and being producible by such simple manipulation, they cannot fail to be largely used by the public.

A process so useful to almost every one, and which almost every one may perform, should be public property, and ought not to be hampered by patent exclusiveness. Since that, however, appeared to be the only means by which I could be recompensed for the time, labour, and money expended on it, I was bound to seek royal protection in the limitation of its use.

The CHAIRMAN said, he thought the Members must all be pleased at the perseverance displayed by Mr. Willis in his researches, with an increase of knowledge so gratifying in this direction that it held out the hope, ere long, of silver-printing being rivalled by the process just detailed. The paper read indicated a variety of ways in which, as the result of future and more general experiment, the process might be applied. In a matter of this sort, little was ever gained by one attempt; it was usually a step-by-step process, often marked by what at first might appear failures, but which, indeed, were not failures at all. It would be well if gentlemen, who applied their minds to any particular study, would give to the Society the successive results they obtained in the course of their experiments. Such information was always valuable, and often saved a great deal of trouble to others who followed in the same path. He asked the Meeting to tender to Mr. Willis their thanks for the communication he had made, at the same time expressing a hope that that gentleman would redeem the promise made in his paper to give to them, at a future Meeting, the results of his further experiments. He was sure that the attention paid by the Members to the communication just read would stimulate Mr. Willis to renewed exertions in this direction.

Mr. WILLIS acknowledged the vote which had been so cordially adopted, and said it would afford him much pleasure to follow up the subject of his paper at a future Meeting.

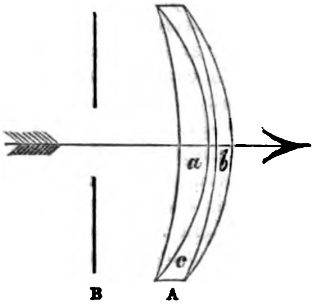
Mr. DALLMEYER read a paper

On a new form of Landscape Lens, including a large angle of view.

I HAVE to bring before your attention to-night a new landscape lens, including a large angle on a flat plate. It is in form a single combination, consisting of three cemented lenses; two of which are of crown glass, of different qualities, and one, the central lens, of flint glass.

The diagram shows the general form of the lens and mode of achromatization.

a and *b* are both concave meniscus lenses of two different kinds of crown glass; and their focal lengths are in the ratio of 1 to 3. Between the two is situated the concavo-convex flint-glass lens *c*, the adjacent surfaces having the same radii of curvature; and the three lenses cemented together produce an achromatic whole, or nearly so. B is the diaphragm, placed at a distance of $\frac{1}{3}$ the diameter or $\frac{1}{15}$ the focal length, of the lens A, in front of *a*. The apertures of the revolving disk forming this diaphragm are certain aliquot parts of the equivalent focal length of A, engraved thereupon.



The lens covers a circle of 92°, defines and equally illuminates with the largest stop (which is $\frac{1}{15}$ of the focal length) an angle of 60° on the base-line of a rectangle of the usual proportions employed by photographers; and with the smallest stop (which is $\frac{1}{30}$ of the focal length) an angle of about 80° on the base-line of a similar rectangle. It produces a minimum of distortion, and gives clean and brilliant pictures free from a central spot or "flare."

Other minor advantages might be named,—viz. greater portability, for it only occupies about one half the bulk of the ordinary view-lenses; greater durability, for the flint or softer glass is protected from injury by the two outer crown-glass lenses of harder material, &c.

Having given a brief description of the instrument, I will now add a few remarks about its origin.

Some eighteen months ago, a gentleman well known among our best amateur photographers, Mr. Russell Manners Gordon, called upon me with a picture taken by him with a lens of his own contrivance, including an angle of from 78° to 80° on the base-line. The picture was fairly defined throughout, and equally illuminated up to the corners.

Mr. Gordon was so delighted with this new acquisition, enabling him to take views composing pictures which had before been impossible, that he impressed me with the desirability of constructing an instrument capable of embracing so large an angle for photographers generally—and, if possible, to be an improvement upon the one he possessed. The lens referred to was simply one taken by him from a French Opera-glass, consisting of two lenses cemented together, and of about 5 inches focal length. A small stop was placed in front, the aperture and best position of which had been determined by careful experiment on the part of Mr. Gordon; and I gladly bear testimony that no optician could have done it better for the ends in view. Yet it did not satisfy him; and he expressed a desire for something better.

On careful inspection of the very beautiful pictures produced by this lens, kindly lent for illustration this evening, you will be able to detect a considerable amount of curvature of field, notwithstanding the aperture of the stop employed was small, being but $\frac{3}{16}$ths of an inch for a focal length of 5 in. The distortion also of marginal straight lines is very great.

With these points before me, I devoted the time at my disposal during the following winter months to an investigation of the case—and now present you with the result.

The propositions to be solved are these. Required a lens or combination of lenses,—first, to include an angle of from 90° to 100° across the diagonal of the picture; secondly, to possess a sufficiently flat field; thirdly, to admit, for the above angle, of the use of the largest possible aperture—the smallest stop not to exceed $\frac{1}{30}$ of the focal length of the lens; fourthly, to produce an image free from distortion; fifthly, to work free from "flare"—or, in other words, to produce a clear and brilliant picture.

Among the existing view-lenses, viz. the ordinary single combination, the aplanatic, the orthoscopic, the triple achromatic, and the globe or doublet, the average circle of illumination does not exceed 70° or 75°. The extension required, therefore, to satisfy proposition 1, amounts to about 20°.

To begin with the lenses, *per se*, free from distortion, by construction—such as the triple achromatic, and the globe or doublet lens. It is possible to extend the circle of illumination beyond the usual angle of 70°, either by increasing the diameter of the lenses (of course, the front and back combinations of the triple achromatic only), or by decreasing the amount of separation of the lenses forming these combinations: but both these operations run counter to some of the other requirements; for the first is attended by greater astigmation of the marginal pencils, and the second by greater curvature of field; both of which necessitate the use of a smaller stop, to correct the error so introduced. An alteration in the forms of the lenses, to obtain the required increase of angle, is likewise attended by similar drawbacks.

Now in the globe or doublet form of lens, a small diaphragm is necessary to correct the great amount of spherical aberration occasioned by the forms of the lenses employed to produce the required amount of flatness of field. And I believe it to be practically immaterial whether both front and back combinations are of the same form, as in the globe lens, or of different forms, as in the old and the more recent doublets.

It is obvious therefore that these lenses, or a modification of them, will not satisfy proposition 3, viz. "the smallest stop" for an angle of 90° "not to exceed $\frac{1}{30}$ of the focal length."

There is also another objectionable feature in the globe or doublet form of lens, viz. that the front combination, exposed to the view, is large (as large, in fact, as the back); and the surfaces of these glasses act not only as refractors, but also as reflectors. When using small stops a "flare," or round spot, in the central portion of the picture is almost invariably the result. My attention was called to this defect in one of the pictures recently exhibited at the North London Photographic Association, evidently taken with a small stop. I believe, moreover, that there is no remedy for this defect, however carefully the lenses may be mounted.

I may here as well observe, in passing, that my principal reason for making the front combination of my triple achromatic lens smaller in diameter than the back was to avoid this defect. But even in this case, under certain conditions of light, and when the lens is worked with the smallest diaphragm, occasionally the central spot of light makes its appearance, in spite of the most careful mounting of the lenses. In fact I invariably protect them with dark *annuli* round the edges—my attention having been called to this point by Mr. Wilson, of Aberdeen, a few years ago.

Before I quit this subject I would impress upon photographers generally, working with double combinations in the field, or even upon interiors, the importance of using no more of their front lenses or combinations than is necessary to fill the required size of plate, if they aim at brilliant results.

This was the experience of one of our ablest photographers, Mr. England, when photographing the interior of the International Exhibition of 1862. He caused me to make for him front stops of different sizes, to slide into the hoods of his No. 1 B lenses; and with a suitable central diaphragm in position, he cut off, by means of these front stops, all unnecessary diameter of the front combinations, retaining only just so much as would cover the required stereo-plate. And who has not admired the brilliant stereograms produced by this gentleman?

To return to the subject in hand. I found that neither the triple achromatic nor the globe or doublet was capable of yielding the required result. I next investigated the case of an unsymmetrical doublet, the front combination of smaller diameter than the back, for the reasons above detailed; but this also did not satisfy the requirements, especially as regards rapidity of action; and it was therefore put aside.

Thus I was induced to return to the single combination, since it promised to admit of a larger aperture for the required angle of 90° or 100° than any of the double or triple combinations above referred to. But here, at the outset, it became necessary to alter proposition 4 to read thus:—Required a lens producing a *minimum* of distortion, instead of "free from distortion." For in view of the other necessary qualities, I believe that a single combination, the contact surfaces cemented, cannot be made to produce an image entirely free from distortion. Here it may be mentioned that, when aiming to embrace an angle of view measuring, say, from 70° to 80° on the base-line projected upon a flat surface, no matter how perfect the combination, as regards the absence of distortion *per se*, the resulting picture is in reality imperfect; for the relation of conjugate foci of the central and marginal parts of the picture and object are not the same. It may, in fact, be considered as having been produced by a series of lenses, the focal lengths of which increase from the centre towards the margin; *i. e.* marginal objects are represented larger than the more central ones —a fact well known to opticians and photographers, which has been recently also referred to by Mr. Sutton.

Now it fortunately so happens that the kind of distortion produced by a single combination tends in the opposite direction to the above, and thus, to some extent at least, the defect is neutralized. The resulting pictures are, to say the least, much more truthful representations of objects than panoramic pictures taken either on curved plates or by rotating lenses, and then viewed on flat boards.

Once more referring to Mr. Gordon's lens, which, as I have already stated, he had by experiment worked to the best advantage, nothing more could be got out of it by any attempt at alterations.

Now, with a view to the solution of the propositions already stated, I ascertained, first of all, the results obtainable by alterations in the ratio of radii of the existing single combination view-lenses, beginning with a plano-convex, and concluding with a deep meniscus externally. To detail to you the results so obtained, even were I to express them in general terms, would, I fear, be uninteresting—the more so, since, after all, it proved unsuccessful; for I found that by employing two lenses only, no matter how achromatized, the desired object could not be obtained.

I next resolved upon an increase in the expenditure of optical means for the lens required, and, in order to gain another element of correction, determined to use three lenses instead of two. The advantages derived from the use of two crown lenses, of different optical quality, for a given combination, amount to, briefly, this,—more perfect correction of the chromatic aberration; and the additional surfaces afford another element of correction for the oblique or excentrical pencils. Thus it became possible to bring before you this evening a lens fulfilling the required conditions, and possessing the advantages I have already stated above.

I now leave it with you to determine, by actual practice, whether it proves another acquisition to your stock of useful instruments, still further enabling you to enhance the value and extend the sphere of that beautiful art of which this Society has been one of the foremost promoters.

In conclusion, I will only remark that the new lens is not intended to supersede the triple achromatic lens—which, over a limited area of field, for copying, architectural subjects, groups, &c., admits of the use of a much larger aperture than the globe or other such compound lenses, and produces clean and bright pictures—but, rather, to *add* to the already existing resources of the photographer.

The Chairman, in the name of the Society, thanked Mr. Dallmeyer for his paper. At all times, he remarked, these practical steps were the most troublesome to make; but the results were most valuable. The Society might be congratulated on the fortunate circumstance that their Meeting had been the medium of so important a communication upon improved instrumental means of photography.

On the table, in addition to a variety of specimens produced by Mr. Willis's process, was exhibited some enlargements on canvas by Mr. Palmer, of Stonehouse.

The Chairman said he had received a letter from Major Russell, promising to read a paper at the May Meeting on "Dry-plate Photography." He had also received a letter from Mr. Pettit, saying that at the June Meeting he should be prepared with a paper upon a subject of high interest, which would form a new era in photography. He also announced that the Exhibition would open on the 2nd May, and that on the following Monday the Soirée of the Society would be held, of which due notice would be given to the Members.

The Meeting then adjourned.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

FIFTH MEETING

HELD IN

THE SOCIETY'S HALL, 117 GEORGE STREET,

MARCH 14, 1865.

Professor MOIR in the Chair.

The Minutes of the preceding Meeting were read and approved.

The SECRETARY read a communication from Mr. THOMAS SUTTON of Surrey, on the Glass Room and Portrait Camera, which appeared in the previous Number of this Journal. At the conclusion of the paper,

Mr. TUNNY said, the fact is stated by Mr. Sutton that all photographers have found the old mode of constructing glass houses to be inconvenient and ill-adapted for the purposes of portraiture. I believe many of the results Mr. Sutton has so severely characterized arise from the facts he has stated. But it must nevertheless be patent to every one, that even in the case of those who are working in the same house or class of houses the quality of the pictures is very different; that is to say, of two operators working in houses of exactly similar construction, one will present pictures which everybody admires, and another will be able to please nobody. We are all aware that Mr. Rodgers works in a house of the old construction; and his pictures are beyond all praise. It is the old-fashioned house, with glass on three sides, placed against the gable of the house, one side (the south) being entirely dark. Mr. Williams of Regent Street works with a house very much as if you were to roof an attic with glass. He has three opaque sides and one open. From the floor to the slope of the glass may be eight feet, and the glass lies on the ordinary slope. There you have pictures very much analogous to those of Mr. Rodgers—among the very finest that have been produced. I have very often thought over the subject of the glass house, and I have seen Mr. Henry Watson's, which is put up on Mr. Sutton's model. The light in that house was according to Mr. Sutton's description, but we found that, the front light being vertical, the amount of light was inadequate to produce a portrait in a sufficiently short space of time. We had to bring it out in order to attain the end. Yet that house was one of the very best. Mr. Dallas, whose house was founded on much the same principle as Mr. Sutton's, would tell them his experience.

Mr. DALLAS said, the glass house I have is very much on Mr. Sutton's principle, but the glass is sloped in front instead of being perpendicular. The objection I have is, that at a certain time of the day, perhaps the most useful time, the light is strongest on the floor, and diminishes as it goes up. I think that would be still more the case with Mr. Sutton's.

The CHAIRMAN. Apparently Mr. Sutton's view is a good one.

Mr. TUNNY. I think so. I see from a notice of Rijlander's, that he had to extend the amount of the light, from the slowness of the operation.

Mr. L'AMY said, I believe one of the greatest difficulties all photographers have to contend with is the direction from which the light comes. There is always some portion of the day better than the rest. The best light is when the sun comes behind the opaque part of the house.

Mr. BROWN moved a vote of thanks to Mr. Sutton for his paper. He thought more depended, however, on the operator than on the structure of the house.

The SECRETARY then read the

Report of the Prize Committee, March 14, 1865.

The Committee appointed by the Council of the Society to select the photographs for which medals were to be awarded, had little difficulty as to the first medal—that for Portraiture.

The beautiful picture by Mr. H. P. Robinson of London, titled "Brenda," so artistic in its arrangements and so perfect in its photographic manipulation, was at once selected as the prize portrait.

This selection was all the more creditable to Mr. Robinson, as there were many portraits of high quality on the walls; amongst which, the productions of Messrs. Nelson, Dallas, Moffat, M'Glashan and Walker, Horsburgh, and Dr. Adamson, may be mentioned; and in this department the Committee would desire to make honourable mention, as regards their grouping and arrangement, of some of the highly artistic picture portraits by Mrs. Cameron of the Isle of Wight.

In Landscape-photography the exhibition was particularly rich; indeed, on no previous occasion had such a noble collection of views been gathered together. Yet, even in the midst of this profusion, there was no difficulty in selecting the prize picture.

There was a difference of opinion as to the particular view to be selected, but all were agreed that to one of Mr. Mudd's pictures the medal must be awarded.

The majority selected "Dunham Park, Cheshire," as the most perfect of those exhibited by Mr. Mudd; and it is worthy of remark that this, which was one of the largest as well as, in the opinion of the Committee, the finest landscape in the room, was produced by a dry process, namely Collodio-albumen.

Amongst the many creditable landscapes exhibited, the Committee would particularly desire to mention those by Messrs. Vernon Heath, Annan, W. D. Clark, Jabez Hughes, Stephen Thomson, Nicol, Kirkland, Herries, Morgan, and Murray.

The third medal, that for the "Best View taken by an Amateur by any process," was awarded to Mr. John Smith, Darnick Tower, Melrose.

There was considerable difficulty in selecting the picture for this medal, but, upon the whole, the Committee thought that Mr. Smith's beautiful and artistic little picture, "On the Leader Water, near Melrose," was the most perfect picture by an Amateur.

The other competitors for this medal were, The Reverend D. T. K. Drummond, Messrs. John Clerk, Nicol, Brownrigg, L'Amy, and Herries.

"For the best View in Scotland," the Committee had much pleasure in awarding the medal to Mr. Thomas Annan of Glasgow, for his large and very perfect view of "Dumbarton Castle." Mr. Annan had several pictures of nearly equal merit, all of a large size.

Mr. W. D. Clark exhibited a great number of charming views in Scotland; but although equally perfect in their photography and in their artistic arrangement, they were not equal in size to those by Mr. Annan, and therefore, as presenting less difficulty in their production, they did not appear to the Committee to be so worthy of the honorary distinction as those of Mr. Annan. The other views in this section were by Messrs. Hunter, Drummond, Kirkland, Beldon, Crombie, Smith, Campbell, Murray, Nicol, Neilson Crow, Peat, Ewing, and Musgrave.

The Medal for "The Best Group" was awarded to Mr. J. Ramsay L'Amy, of Dunkenny, for an excellently arranged picture containing sixteen figures. The other groups were by Messrs. Tunny, Annan, Good, C. Smith, Campbell, Dallas, and Mrs. Cameron.

The Council had reserved the power of awarding extra medals for any work of merit not included in the above list, and they have given a medal to the Pantascopic Company, for the very beautiful panoramic pictures produced by their ingeniously constructed Pantascopic Camera.

Another extra medal was awarded to Mr. Samuel Highley of London, for his admirable Microscopic Slides for the Magic Lantern.

At a recent Meeting, the Society had an opportunity of witnessing the effect produced by those slides when enlarged by the lantern and oxyhydrogen light.

In name of Prize Committee,

T. B. Johnston, *Hon. Sec.*

Professor Moir said, I find myself in the position of representing our distinguished President, Sir David Brewster, who, although he has given us his presence on every possible occasion, is unfortunately absent this evening. On me therefore devolves the duty of presenting the prizes which have been awarded by the Council. I am afraid that in most cases they must be received by proxy, and that we must ask our Secretary, Mr. Johnston, to transmit them to many of the gentlemen who have been selected to receive them. It has been a subject of great satisfaction to the Council and all concerned, to know that the prizes they proposed to award have all been given to competitors who well deserve them. The only regret the Committee had was, that they had not had more prizes to give; for, looking round the walls of last Exhibition, I must say there were a great many pictures of every kind for which, if we had had more in our power, we would have been delighted to give additional prizes. The gentlemen to whom we have assigned those we have been able to bestow are already in most instances well known to the Society. The first prize was, without any doubt or hesitation, given to a gentleman who, we are proud to think, has been associated with us from the commencement of the Society. At every exhibition we have had, he has been a distinguished contributor, and he has already gained six of our prizes. He has taken four prizes for what are called composite pictures, some of them of distinguished excellence, such as the "Bringing Home the May," with which you must all of you, who are photographers, be perfectly conversant. He has also gained a prize for his *cartes de visite*, and another for a most beautiful landscape. He now comes forward to take the first prize in pure and simple portraiture; and I would say that the last picture he has now exhibited, called "Brenda," is to my mind more completely satisfactory than all the composition pictures which Mr. Robinson has ever yet displayed. It is to my mind a perfect portrait, as complete in pose, in manipulation, and in light and shade as anything I can conceive of. We now come to another gentleman, with whose works we are also familiar, who has also contributed largely to our exhibitions and taken our prizes—Mr. Mudd. On former occasions we have awarded him two prizes in our competitions. On the present occasion, the competition was not between Mr. Mudd and any other person, but between Mr. Mudd and himself. The difficulty we had was not who should get the first prize, but which of Mr. Mudd's productions we should select for the prize. On that point, as the report tells you, we had some little difference of opinion. Some of us were inclined to prefer a most admirable photograph of an old, decayed and almost blasted tree; others said that, while the picture before you (Dunham Park) possessed all the photographic merit of the other, it was the more pleasing subject; and accordingly it was preferred. The third gentleman on our list is one who, I regret, did not on former occasions receive our prize. He was always very near it, but, by some unfortunate circumstance, somebody always happened to get ahead. I have now great satisfaction and pleasure in announcing that the Council has awarded to Mr. Annan the prize for the best landscape in Scotland. I remember very well seeing a picture of his some years ago, which appeared to me to be of very high character, and which I felt sure was an index to his future advancement. I think it was called "the Last Stocks of Harvest," or some such name. It was exhibited here, and afterwards in London, where it was very highly admired. I felt sure, on seeing that picture, that Mr. Annan would not be long in gaining our honours, and I am sure we will all be ready to congratulate him on his success on this occasion. The next two gentlemen I have to name are amateurs. It is very flattering to us, and, I hope, agreeable to the professional members, to find that the amateurs are able to take a portion of our prizes. I allude to Mr. Smith and Mr. L'Amy. Mr. Smith has exhibited only a small view, but it is one which possesses highly artistic qualities; and its merits are not at all in proportion to its size. My friend Mr. L'Amy has achieved a great triumph over a difficulty felt by every one who has tried to do what he has done—namely, grouping a large number of persons under conditions which shall make the attitudes at once life-like and pleasing. There remain two prizes which are not perhaps strictly or absolutely given for photographs, though they are given in connexion with photography. One is the prize we have given to the Pantascopic Company for a new camera, and the other the prize awarded to Mr. Samuel Highley for his slides. It appears that the Pantascopic Company's prize is presented on a somewhat complex view, partly for the beautiful panoramic landscapes, and partly from the ingenuity of the camera by which they are produced, and the additional power of introducing a large angle which the camera professes to give, and which I must admit it does give. At the same time it is right I should say, I do not understand that that camera will be suited to all kinds of architectural portraiture. If you attempt to take the portrait right in front of the object, the inventors admit at once that the camera will not suit: it will give a certain amount of curvature to the view; so that if the picture were taken directly opposite, it would represent not a straight line, but a curve. But the Company do not claim that it will take architectural portraits absolutely parallel to the object, whereas, taking a certain angle, it will do very well. I think it right to say that I have ordered one of these cameras, and found it to accomplish what it really professes to do. Mr. Highley's slides I had not the opportunity of seeing, but from what I have heard of them they appear to be very admirable. I think that in making these two extra prizes, we have not gone beyond our powers; and in asking Mr. Johnston to send the prizes to those gentlemen who are not present, I have to request him, in your name, to add the thanks of the Society, and, shall I say, our sincere gratitude for favours to come. [Hear and applause.]

Mr. Smith and Mr. L'Amy, who were present, received their medals from the President of the meeting.

Medallion portraits in pyrian and terra-cotta, by the International Photo-Sculpture Company, were exhibited by Mr. E. W. Dallas, who has been appointed agent for Edinburgh.

SIXTH MEETING
HELD IN
THE SOCIETY'S HALL, 117 GEORGE STREET,
APRIL 11TH, 1865.

Colonel BELL, in the Chair.

The Minutes of the preceding Meeting were read and approved.

The SECRETARY read the following communication from Mr. THOS. RODGER, St. Andrew's:—

On the Temperature of the Baths and Developing Solutions, as affecting Photographic Operations.

I PURPOSE in the following short paper to call your attention to the importance of giving heed to the temperature at which the bath and developing-solutions are kept during photographic operations, and to bring before your notice a simple contrivance which I have had in operation for some time, and which I have found to be most efficient for the purpose of regulating this.

I presume that there are very few now a-days unaware of the effect of variations in temperature on their photographic operations, especially noticeable as winter approaches, and in the height of summer. In the former it is found that a great increase in the time of exposure becomes necessary, and that even with this there is a marked falling-off in quality of negatives, these being characterized by harsh lights and consequent deficiency in half-tone, &c., and otherwise presenting much the appearance of pictures produced with a bath too acid, or with an inferior collodion. These appearances are not by any means dependent altogether upon the weakened character of the light. Again, in the height of summer even greater uncertainty and annoyance prevail; appearances present themselves, and disappear again, without a sufficient cause being assignable, such as flat overexposed-looking negatives, chalky blotches, and pin-holes and marks of various sorts. Now, from my own experience, I can unhesitatingly assert that the greater part of this hindrance to successful photography throughout the year can be removed by a judicious appliance of means by which a steady temperature can be maintained, in that all-important solution the negative bath especially.

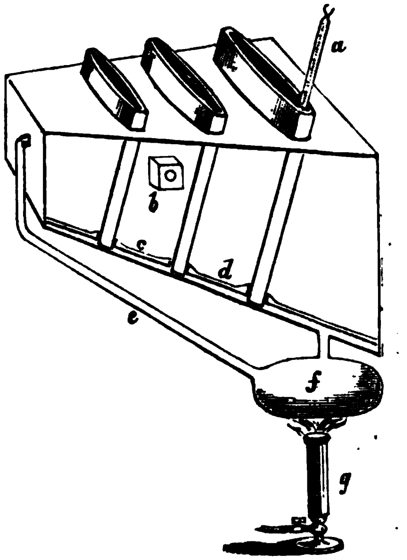
I have frequently observed that photographers are satisfied that all is right in regard to temperature when the thermometer in the operating-room indicates a certain degree of heat, such as 60° or 70° F. This I have repeatedly proved to be deceptive by plunging the thermometer into the bath-solution, and found it to indicate 40° or under, even though the room may have been at 60° or 65° for two or three hours previously, the consequence often being that the whole available portion of a winter day is lost before the bath-solution is in a serviceable condition. In summer, on the other hand, it will frequently be found that the bath-solution is at a much higher temperature than the surrounding air, from the frequent preparation of plates, &c. (which exercises a heightening influence on temperature). I have found it to indicate a temperature of 80° and 90° when the operating-room was at 60° F., and this with a moderate-sized bath-dish for whole-plate and 8×10, and containing the full amount of liquid. It is proper to remark here that the difference in temperature between the bath-solution and the surrounding air will be less marked when the quantity is greater and a like number of plates under preparation.

To overcome all difficulty in the matter, however, nothing else will be found necessary but to employ the arrangement which I shall now describe as clearly as possible,

The arrangement I have in use is made for three vertical bath-dishes, namely, for the whole plate, 8×10, and 10×12 sizes; and these are made of thick green glass (a very excellent kind of bath-dish, and superior to porcelain or gutta percha for nitrate-of-silver solutions). It will perhaps be better to give the dimensions of my arrangement, along with the description.

This consists simply of an oblong zinc trough, shaped so as to allow the tops of the three dishes to be nearly level, and at the same time to contain no more water than is actually necessary. Inside this trough, at the bottom, there is a wooden frame fixed, having three bars of wood placed across at equal distances, for the purposes of supporting the dishes; these bars have ledges projecting upwards about half an inch, which serve to keep the dishes from sliding forward or backward. On the top is fitted a board, having three openings cut in it, sufficient to admit the bath-dishes. In the side of this trough, as high as it is desired to have the water, is cut a small hole, half an inch in diameter; and over against this hole, but communicating with it, is attached a small zinc box, 3 inches long and 2 wide: this is for the purpose of filling the trough, and also to enable one readily to know that the trough contains the proper amount of water.

The heating is managed thus:—At the bottom of the trough, at the deepest end, there is attached an iron cup, 6 inches in diameter and 4 inches deep. The water from the trough is allowed to pass into this by a short tube, 2 inches long. Now from about the middle of this cup a tube passes externally along the bottom of the trough, and following its upward direction; it is bent upwards in front of the vessel, and is made to enter it, an inch and a half below the water-level. A Bunsen flame is placed below the cup, and a current of heated water is established, which speedily and uniformly brings the whole arrangement to the desired temperature. The annexed diagram may be useful in enabling the foregoing description to be more easily understood.



a. Thermometer.
b. Water-gauge.
c, d. Frame for keeping baths in position.
e. Pipe conducting heated water.
f. Iron vessel.
g. Bunsen lamp.

The arrangement is made to rest on two iron brackets fastened to the wall; and a box-lid is attached, which closes in the baths and the dippers.

In practice it will be found best to stop the heat when a thermometer which should be kept constantly in the largest dish is at 55° F. In a short time it will be found to rise to 60°, and to remain at this for a considerable time.

It will be found that to work in winter at from 60° to 65° will be most satisfactory, and that in summer from 55° to 60° will be best. In summer it will seldom be necessary to apply heat; and should the temperature rise higher than 60° (which is not likely, owing to the large body of water surrounding the solution), the introduction of a few pieces of ice would quickly lower the temperature. As a means of getting rid of an excess of ether and spirit after a bath has been much used, it will be found an excellent plan to raise the heat for an hour or two to 160°; and after this it will generally be necessary to filter. In order to protect the inside, of the trough from small quantities of nitrate-of-silver solution which may get in, it is necessary to give the interior a coating or two of red-lead paint.

In regard to the temperature most suitable for the developing-solutions, about 70° seems to be a good and safe limit. A very little beyond this will frequently produce a fogged appearance in the shadows. It is, however, of much importance in weak light and low temperature to apply this solution above the ordinary temperature.

The foregoing remarks are entirely of practical interest; and attention to them has afforded me such an amount of satisfaction and uniformity of negative, independent of season, as to form a sufficient excuse for bringing the subject before your notice.

A discussion followed the reading of this paper, in which several of the Members took part. All were of opinion that temperature had the greatest influence on the bath and developing solutions; at the same time it was difficult to understand the great difference said to exist between the temperature of the bath and of the room.

Mr. Nicol kindly undertook to make a series of experiments on the subject, and report the result at next Meeting.

The Secretary then read the following

Notes of the Wöthlytype Process.

By J. T. Taylor, Esq., of London.

So far as I am aware, this subject has not been brought under the notice of the Photographic Society of Scotland. Instead, therefore, of writing on the subject, which I originally intended, I shall submit to your notice some specimens of that kind of positive printing known as the Wöthlytype process, accompanied by some brief remarks on the subject.

The process is based on certain discoveries made by Mr. Burnett, which were published in a paper read by that gentleman before this Society. The main feature of his discovery is, that salts of the sesquioxide of uranium exposed to light, in contact with organic substances, are decomposed, being reduced to a lower oxide of that metal. This lower oxide possesses the property of reducing nitrate of silver, chloride of gold, and the salts of other metals. If a sheet of paper be washed over with a solution of nitrate of uranium in a dark room, dried, and exposed under a negative for a few minutes, on being removed and washed over with a solution of nitrate of silver, a beautiful picture at once springs into existence.

The *rationale* of this development is simple. After the exposure under the negative, some parts (those acted on by the light, have a much greater affinity for oxygen than other parts; and on brushing the silver-solution over the surface, the reduction of the silver takes place according to the amount of reduction (by light) of the uranic salt. Uranium being only the agent employed in the reduction of the silver by which the visible image is formed, it will be evident that the picture itself is composed of silver, and not of uranium. If the uranium and the silver be mixed together and applied to the paper, the picture will, as in ordinary silver printing, be visible after a very brief action of the light; and if the soluble salts (the nitrates of uranium and silver) be removed by washing, we shall have a picture in silver similar in composition to that developed in the former case.

Bearing these things in mind, it is now interesting to inquire wherein consists the peculiarity of Herr Wöthly's discovery. Many have alleged that this discovery is a mere carrying out of the principles, and an improvement on the practices, of uranium printing, with which all of us who are members of the Photographic Society of Scotland have for so many years been familiar. It is well known to us that Mr. Burnett conducted his experiments rather as a man of science than as an artist; that merely beautiful prints were what he had little sympathy for, or at any rate did not contemplate in his experiments; and that many did not recognize in the numerous "scraps" which, from time to time, he exhibited at the meetings of this Society, anything more than queer-looking pictures, no better, if even so good as the ordinary photographic productions of the time. Notwithstanding this, however, some of the scraps which he produced possessed great pictorial merit as well as scientific interest.

It is now several months since Herr Wöthly, having modified the details of uranium printing as formerly known and practised, allowed it to assume his name; and consequently it has now become well known by the euphonious title of the "Wöthlytype process."

This process, in brief, is as follows:—Collodion, previously saturated with the nitrates of uranium and silver in certain relative proportions, is poured over the surface of a sheet of paper. This is suspended in a dark room until dry, after which it is exposed under a negative in the usual manner. When the details are all brought out, the sensitive salt is removed by washing. The tone is now of a bistre character, which is not usually approved of, and to improve which it is immersed for a brief time in a toning-solution. When the desired tint has been obtained, it is removed, rinsed, and dried. Such, in brief, is the Wöthlytype process.

The paper most suitable for giving good results is found to be a close-grained, hard-sized kind, the size employed being preferably arrow-root. Mr. Sanford, the well-known photographic paper-maker, prepares that which is used in this country. I have been present during its preparation, and was struck with the amount of time and care bestowed on each sheet. The operator, having laid the sheet of paper flat on a glass slab before her, charged a large sponge with the thick, pasty-looking size which stood in proximity to her, and rubbed every part of the surface over in a thorough manner for some minutes. As no one here is likely to care for minute particulars concerning the process of sizing, I shall not further allude to it, more especially as the paper can be purchased ready prepared much cheaper and better than any one could do it himself.

The collodion is of considerable consequence in this process, as much of the beauty of the print when finished depends on it. Those who are desirous of preparing collodion for this purpose will do well to adopt that which is recommended by Mr. Henry Cooper, a young gentleman who has devoted much time to this process, and who, perhaps, is one of the best experimentalists in London. To prepare the cotton, immerse one ounce of it in a mixture composed thus:—

Nitric acid (1·390)	6 fluid-ounces.
Sulphuric acid (1·845)....	18 „ „
Water	4 „ „

Immerse the cotton when the temperature is about 120° Fahr., and allow it to remain for a quarter of an hour. When washed and dried, it is dissolved in alcohol and ether in the following proportions:—

Alcohol	3 ounces.
Ether	1 ounce.
Cotton	30 grains.

This, I know from experience, produces a very excellent collodion for the purpose.

But the collodion must be sensitized. This is effected by saturating it with nitrate of uranium in the first place, and afterwards with nitrate of silver. Of the former from twenty to thirty grains will be taken up, while of the latter not more than one-sixth of this quantity will be dissolved. Indeed, in most of the specimens which will tend to illustrate this paper, the strength of the silver was not more than three grains to the ounce of collodion.

The presence of a little castor oil is found to improve the result. Equal parts of castor oil and an ethereal solution of Canadian balsam are mixed together and added, *quant. suff.*, to the collodion.

The United Association of Photography (Limited) work this process very extensively. This Association was the first to introduce it, in its present form, into this country. I have been present in their laboratories when the nitrate of uranium was made. That which is produced by them is of a very different nature from that which is usually obtained in commerce. I procured at the same time some specimens of this salt from four different chemists in town. At present they are lying in the bottoms of their respective bottles in a wet, pulpy mass, while that which I received at the same time from Lieut.-Col. Stuart Wortley, the president of the Association alluded to, still remains unchanged, being exactly in the condition in which I received it. I believe that much of the unfavourable and uncertain results obtained by this process shortly after its introduction to this country arose from the bad quality of the nitrate of uranium obtained in commerce. The excellence of the nitrate of uranium now manufactured by the United Association of Photography is owing to the number of times which it is precipitated from its solution by means of ammonia, the precipitate being afterwards very carefully washed and re-dissolved in nitric acid. I experienced no difficulty whatever in seeing the whole process of the manufacture of this salt, and any information which I desired concerning it was very readily given.

The operation of coating a sheet of paper with uranized collodion is a very simple one. The paper is attached to a flat piece of board by means of two or more pins, and the collodion is then applied as though it were a glass plate. This, of course, must be done in the dark room. The sheet of paper is then suspended in any convenient way until dry, after which it may either be laid aside or used immediately. A great advantage to amateurs will be found in the fact that a supply of this paper may be kept sensitive in stock ready for use at any moment. This will prove a feature which many will appreciate. It is exposed under the negative in the usual way.

With respect to sensitiveness, many experimentalists have found that it is more sensitive than ordinary albumenized paper. This is the case when the albumenized paper has been excited on a forty- or fifty-grain bath; but when a bath of greater strength has been employed, I do not think that the one printing-process possesses any advantage over the other in this respect. When we reflect that the uranium collodion contains only two or three grains of silver to the ounce, the great sensitiveness of the Wöthlytype is indeed a matter of wonder.

If the sensitive paper has been kept in a very dry place, and is taken directly from it and inserted in the printing-frame, the resulting picture will not be so good as it would have been had the paper been previously kept in a moist place, such as a damp cellar. It is a curious fact that this paper keeps most admirably in a very damp atmosphere. If, then, the paper has been kept in a very dry place, it is much better not to expose it under the negative until it has first been subjected to the action of moist air. When a dark, damp cellar cannot be obtained for this purpose, the presence of a kettle of boiling water in the operating-room will secure at once the necessary hygroscopic conditions. It is only seldom that, in Edinburgh at least, the state of the atmosphere will render such a course necessary. Before placing the paper in the printing-frame, then, see that it has been for a short time previously in an atmosphere not too dry.

When exposed to light the paper becomes of a greenish colour. This is the sign that all is going on as it should do. A silver print usually becomes of a deep violet colour as the exposure proceeds; a Wöthlytype print becomes of an olive-colour.

No over-printing is necessary, as in the case of printing on albumenized paper. So, when the eye is satisfied with the amount of vigour and detail, the picture may be removed from the printing-frame. When it presents a red or brown colour at this stage, I find that the finished picture is not of such an agreeable tone as when it is of an olive tint. A sheet of paper having been made very dry by being placed in a box with some chloride of calcium, one half was then exposed while in its dry state, the other, previous to its exposure, was placed for ten minutes in a very damp atmosphere: the latter gave the better picture of the two. The former assumed a red tone under the negative, and the latter became a very deep green.

When removed from the printing-frame, the print must be immersed in a bath of water to which has been added some acetic acid. It should remain in this for about eight or ten minutes, at the end of which time the whole of the nitrate of uranium will have been dissolved out. It is then rinsed under the tap for a few minutes, and transferred to the toning-bath. The acid water from which it has been removed should be retained, as all the uranium may with great ease be recovered from it. When ammonia is added to it, the uranium is at once thrown down as an oxide, for which, when washed and dried, the sum of 15*s.* per pound can be readily obtained; or, if preferred, it can be converted into the nitrate of uranium again, by dissolving it in nitric acid. The best strength for the washing-bath to which I have alluded will be found to be one part of acetic acid to forty parts of water. The duration of the washing in this bath will be sufficient when the yellow colour of the uranium is found to have disappeared entirely from the print.

The toning-bath may be made in a variety of ways; but in all cases it is desirable, if not absolutely necessary, that hyposulphite of soda or lime, or sulphocyanide of ammonium be added to the toning solution. The latter of these fixing agents seems to have been generally adopted in preference to the others. Many of the pictures which will be exhibited to you this evening were toned in a solution made in the following proportions:—In an ounce of water dissolve 1 drachm of sulphocyanide of ammonium, in another ounce of water dissolve 1 grain of chloride of gold: pour the latter into the former, stirring with a glass rod all the time. This solution will prove very energetic, and the print will in a brief time assume a pleasing violet tone. This toning-bath keeps well, and may be used as long as there is a vestige of gold remaining in it. After removing the print from the toning-bath, it is again subjected to a washing under the tap. This is best effected by means of a slab and a sponge. A few minutes' washing suffices. After it is dried the operation is finished.

Some have found that the collodion is apt to rise in blisters. I have never experienced this, and I can venture to assert that, if the collodion be made according to the formula which I have just given, no annoyance will be experienced from this source.

In this process the prolonged washing incidental to the operation of printing on albumenized paper is entirely got rid of. The print may, if necessary, be entirely finished and mounted within a few minutes after its removal from the printing-frame.

Among the specimens which are submitted for your inspection are some on ivory. In my estimation the Wöthlytype process is better adapted for impressing an image on ivory, so as to meet the requirements of the miniature painter, than any other printing-process yet practised. The ivory is first prepared with pumice-powder, then coated with the sensitive collodion, and all the subsequent operations performed in the same manner as if it were a paper print. A few drops of alcohol and ether suffice to remove the collodion, and the image will be found to be in the ivory itself. It is now ready for the colourist. I have also frequently printed on engravers' boxwood by this process. It is of great value for this purpose, as the texture of the wood is not damaged in the least degree. This, at least, is the experience of a wood-engraver who has frequently tried it.

If, in these remarks, I have left untouched any topics connected with this subject, on my attention being directed to them it will afford me much pleasure, at your next meeting, to supplement my remarks.

The specimens were greatly admired for their delicacy and the beauty of their colour.

Mr. Tunny proposed a vote of thanks to Mr. Rodger and Mr. Taylor, which was carried unanimously, and the Meeting adjourned.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The Annual Meeting of this Association was held in Myddelton Hall, Islington, on Wednesday evening, March 22, G. Dawson, Esq., in the Chair.

The Minutes of the last Meeting having been read and confirmed, the following Gentlemen were elected by ballot Members of the Association:—Mr. R. Temple, Mr. W. A. Clark, Mr. W. Bedford, Mr. H. Smith, Mr. W. Malby, and Mr. R. M. Gordon.

Mr. W. W. King then read the Annual Report of the Committee for the past year.

Your Committee have great pleasure in reporting the continued prosperity of the North London Photographic Association, and the addition of several new Members, amongst whom are photographers of the highest eminence.

Although papers have not always been forthcoming, yet the following subjects will prove that there has been no lack of interesting matter for discussion at the various Meetings:—

Mr. Sydney Smyth on Enlargements by the Solar Camera.

Mr. George Dawson, M.A., on the Use of Nitrate of Soda in the Printing Bath.

Mr. Bockett on Cheap Contrivances in connexion with Photography.

Mr. Stephen Thompson on Photography among the Alpine Passes of Switzerland, Italy, and the Tyrol.

Mr. W. Warwick King on neglected Art-fields for Photographers.

Mr. W. H. Warner on a New Camera Stand.

Mr. W. Hislop, F.R.A.S., on a Camera Stand invented by him.

Mr. Highley exhibited some Photographic Slides of Geological and other subjects by means of the Magic Lantern.

Several manufacturers have contributed new apparatus, and we must not omit to mention the demonstration of the use of the oxyhydrogen light in the magic lantern, by Mr. James How, of Foster Lane, whose illustration of microscopic objects from Dr. Maddox's very beautiful photographs was in every way most valuable.

To Mr. Francis Bedford the Society has been much indebted for the occasional exhibition of some of his finest photographs, especially those illustrative of our national antiquities.

Allusion has been made to the want of papers at our Meetings. Your Committee have good reason to hope that this for the ensuing year will be fully supplied, as they have received several promises of papers from Members and others well known in the photographic world.

It is contemplated by a number of influential residents in the northern part of London, to hold an Exhibition of Arts and Manufactures at the Agricultural Hall next autumn. Arrangements have been made for devoting a part of the exhibition to Photography.

This will doubtless be under the management of your Committee, one of your Members being amongst the earliest promoters of this most desirable scheme; thus an opportunity will be afforded for a Photographic Exhibition in this district of London, which your Society has often heretofore contemplated, but never been able to carry out.

Your Committee have deemed it advisable to suggest that the number of Vice-Presidents shall be four, instead of two as at present.

The 'British Journal of Photography' having been since your last report issued weekly, your Committee have found it necessary to discontinue the supply of that periodical to the Members, but they are of opinion that a special vote of thanks is due to Mr. Greenwood at the termination of their connexion.

Feeling, however, that your Society should still have an official representative publication, your Committee put themselves in communication with the Photographic Society, for the purpose of a supply of their Journal to your Members. In answer thereto they have to state that the Parent Society has met them on most liberal terms, and arranged to send its own reporter to your Meetings. By a recent resolution of its Council, Members of your Society will have the right of admission to all ordinary Meetings of the Photographic Society.

The course thus taken will, it is submitted, tend greatly to the advantage of your Society, as, without any higher subscription than the present, it will be kept *au courant* with the chief improvements in Photography, and be enabled to increase the number or value of photographs presented to your Members.

Members not wishing to have the Journal will receive an additional photograph.

Your Committee have taken into consideration the change of the day of meeting. Your present days have always had an uncertainty about them. They therefore propose to hold your meetings on the first Wednesday in every month—instead of the last Wednesday but one, as at present.

In conclusion your Committee would urge you to exertion, both in providing subjects for exhibition at, and papers for, the Meetings, as it is only by the active interest of every Member that the Society can maintain a good position in Photography.

The Treasurer's Account, which was presented, was as follows:—

Dr. *The Treasurer in Account with the North London Photographic Association.* *Cr.*

	£	s.	d.		£	s.	d.
To Balance from last year	32	16	8	By Photographs and Journals	62	13	7
Subscriptions	73	6	6	Rent, Printing, Stationery, Postage, &c.	11	19	9
				Balance	31	9	10
	£106	3	2		£106	3	2
To Balance in hand	£31	9	10				

Examined and found correct.

J. COLLIS, } *Auditors.*
J. HOW, }

March 22, 1865.

D. W. HILL, *Treasurer.*

The Report was unanimously adopted.

Mr. King said he thought it desirable that the Members should take some special notice of that clause in the Report which referred to the liberal and kind manner in which the Parent Society had fallen in with the views of this Association with respect to the supply of the Journal. He had the pleasure to inform the Meeting that the Council of the Parent Society had, without being asked to do so, invited the Members of this Association to attend any of the Ordinary Meetings held at King's College. Under these circumstances, he had the satisfaction of moving a vote of thanks to the Council of the London Society for their courtesy and consideration.

Mr. Bockett seconded the motion.

The Chairman said he was sure there could be but one opinion upon this subject; the Council of the Parent Society had certainly met this Association in a very handsome manner, and he thought they would gladly reciprocate the kindness shown to them by offering to any Members of the Parent Society a cordial welcome at their Meetings.

The resolution was put and carried unanimously.

The Meeting then proceeded to the discussion of the recommendations in the Report of the Committee, as to the alterations of the Rules of the Association. After some conversation upon the subject, it was agreed that the number of Vice-Presidents be increased from two to four; that the meetings of the Association be held on the first Wednesday evening of the month instead of the last but one, the Annual Meeting being for the future held on the first Wednesday in March; and that the Members of Committee deemed eligible for re-election should be those who had attended at least half the Committee meetings of the previous year.

The election of officers then took place.

The Chairman intimated that he wished to resign his position as one of the Vice-Presidents.

The following gentlemen were appointed:—

President: Chas. Woodward, Esq., F.R.S., J.P. Vice-Presidents: G. Shadbolt, J. J. Cole, F.S.A., W. Hislop, F.R.A.S., W. W. King. Committee: Messrs. Ackland, Bockett, Cooper, Foxlee, Gossett, How, Robinson, Simpson. Treasurer: D. W. Hill, Esq. Hon. Secretary: John Barnett, 12 Ockenden Road, Islington, N.

Mr. Collis exhibited some fine specimens of cameo pictures by Mr. Long, of Exeter, containing five portraits in each, styled "Quinque Gems;" also an enlargement on painters' canvas by the solar camera, by Mr. Palmer, of Stonehouse, Devon.

Mr. Cooper produced some excellent examples of the Wöthlytype, and some specimens of sulphocyanide and gold toning with ordinary albumenized prints.

Mr. Wharton Simpson showed a number of specimens of his collodio-chloride process.

Mr. Robinson exhibited specimens of Mr. Gill's "doubles," presenting a representation of the same individual in two places in one picture.

The various specimens having been carefully examined,

Mr. Hislop said the Association was much indebted to those gentlemen who had favoured them with the exhibition of the photographs now produced. With reference to the pictures laid upon the table by Mr. Simpson, no doubt most of the

Members had become acquainted with the details of the collodio-chloride process by reading the description given in the paper read by Mr. Simpson at the last Meeting of the Photographic Society. It seemed to him that this process possessed a peculiar interest, and that many photographers would be anxious to make experiments upon it, if they knew where to procure the materials ready prepared. A plain collodion was an article which few persons, and especially amateurs, would be likely to have by them; and he would suggest that it would be desirable some of the dealers should undertake to supply this collodion prepared according to Mr. Simpson's excellent formula, in order that they might proceed to test the process for themselves. If that were done, it was possible that still more interesting and important facts would be elicited; and he hoped that some of the Members would at a future meeting of the Association report the result of their experiments. Referring to the specimens now exhibited, he thought there could be no difference of opinion on the point, that they were certainly amongst the finest photographs they had ever seen.

Mr. **Cooper** said he had seen, in the different photographic journals, that Messrs. Mawson and Co., of Newcastle, were advertising a plain collodion at 4s. per lb. He had procured some and used it for Mr. Simpson's process, and also for the Wöthlytype, and found it answer very well. It was prepared expressly for uranium printing; and it would be well to know where to procure it in small quantities just for experimental purposes.

The **Chairman** said it appeared to him that the great objection, both to the Wöthlytype and to all collodion printing on paper, was the instability of the collodion itself. He thought it could not easily be proved that collodion applied to paper or any other substance possessed the element of permanency. In carbon printing in which collodion was employed, it invariably split up in different conditions of the atmosphere; and they knew also that with negatives, if unvarnished, let them be kept however carefully they might, the collodion would sooner or later be decomposed. It seemed therefore to him that they were working in the wrong direction to apply collodion to paper. It might be, however, that chloride of silver could be held in suspension in other substances besides collodion, such as albumen or gelatine, in which case they would have a greater chance of permanency than they could now secure.

Mr. **Hill** said he did not see how the collodion could split off the paper, because it penetrated the substance of it.

Mr. **Simpson** said, to a certain extent it would. He thought photographers would receive with considerable hesitation any idea to the effect that the material of which they formed their negatives, and upon which so much depended, was of a very perishable nature. All experience was against such a conclusion. In the early days of the collodion process, it was a common thing to use negatives without varnishing them; and he never heard of one decomposing or splitting off the glass, except by scratching, &c. He had in his own possession collodion positives and negatives which he had kept unvarnished for at least ten years without injury. Dr. Diamond had some which were taken in 1850, now as perfect as the day on which they were taken. This was, he believed, a general experience. As to splitting off the paper, that was purely a matter of practice; if a suitable collodion were used, no such danger would exist. Many of the samples on the table were taken on paper which had not been sized or prepared in any way, and the collodion could not possibly be removed by splitting; it must be dissolved before it could be removed. If a very unsuitable horny collodion were used, it would, of course, be easy enough to make it split off. He had had many scores of Mr. Swan's specimens through his hands, and had several now in his possession which he had had twelve months, and he had not seen such a thing happen in a single instance.

Mr. **King** mentioned with regard to Swan's carbon process, that he had seen in Newell's window in the Strand a specimen which was cracked all over. He had also seen others in the same state.

Mr. **Simpson** said he thought that was due rather to the gelatine with which it was mounted than to the collodion.

Mr. **King** said, he made the remark with regard to Swan's collodion.

Mr. **Cooper** said it must be remembered that in collodion printing the collodion was applied in a very different way to that in the carbon process. In the latter it was poured on glass and dried, and then formed part of a tissue with gelatine, the whole being subsequently attached to paper by mounting. In collodion printing it was poured on the paper, with the fibre of which it became, as it were, entangled and entwined; so that if it were at all of suitable quality, there was much less danger of its cracking or peeling off.

The **Chairman** remarked that the object of all the collodion processes was to fill up the pores of the paper so completely that the print should not sink into the surface, and therefore there was little chance of the collodion uniting with the fibre. In his own experiments with the Wöthlytype, he found that when he filled the pores entirely, the film almost invariably could be removed from the surface, especially where it was sharper and better defined than ordinarily. It might be that under certain conditions the collodion would so entwine itself with the paper that it would be impossible for it to crack or peel off, but he doubted it.

Mr. **Simpson** said that many of the specimens he had exhibited were on paper which had not been prepared in any way, and therefore there had been no special aim to keep the image on the surface. Several of them were on Whatman's drawing-paper, without any preparation at all. He believed the question of the collodion leaving the paper was one entirely dependent upon the physical condition of the collodion.

Mr. **Foxlee** said he had recently seen in the 'Photographic Journal' a report on the decomposition of pyroxyline; the same thing might, perhaps, be true of collodion.

Mr. **Hislop** did not think it was, for he had kept prepared dry collodion plates for at least seven months, without varnish or any preservative, without observing the least tendency to decomposition.

Mr. **Simpson** said the article to which Mr. Foxlee referred related to gun-cotton rather than to pyroxyline. Photographic pyroxyline might under some circumstances be doubtless liable to spontaneous decomposition; but it was an exaggeration to regard this as a necessity, or even a matter of frequent occurrence. He had in his possession, kept loosely in jars, pyroxyline which had been made for years, in which no change had taken place. Some of the specimens on the table were produced with a cotton he had himself prepared five years before, and kept without any special care.

The **Chairman** said the most soluble kinds of pyroxyline were the most easily decomposed. They gave very fluid collodion, and if put in boiling water, would evolve fumes directly.

Mr. **Cartland** said the Association were much indebted to Mr. Simpson for a sight of such beautiful specimens as those produced, and he thought all experience pointed to great probable permanency in them. Doubtless suitable materials for producing them would be soon found in the market. It was impossible to look at such pictures without seeing that a great step in the right direction had been made in positive-printing, and he thought that, instead of depreciating the process, the best thanks of photographers were due to Mr. Simpson for the invention.

Mr. **Hislop** inquired whether Mr. Simpson had found the presence or absence of size produced a different effect.

Mr. **Simpson** said, on the whole, he found that the hardest and best-sized papers were the best for the purpose.

Mr. **Foxlee** thought that in this process they must confine themselves to the use of collodion.

Mr. **Simpson** said he was afraid that the Chairman's suggestion as to holding the nitrate of silver in suspension by the use of gelatine was open to serious objection. The nitrate of silver could not be added to albumen without coagulating it, and as for gelatine, supposing it could be used as a vehicle, it would be impossible to tone, fix, and wash the print without dissolving it off the paper.

Mr. **Collis** said, with reference to the permanence of collodion, a gentleman sitting by him had mentioned that some of the original positives taken at the outset of the collodion process were still in existence. He had himself some which were taken in 1851, which showed no signs of decomposition.

After some further conversation on this subject,

Mr. **Bockett** read the following paper

On Binary Photographs.

As I thought it not unlikely that some of our Members might wish to take some of these peculiar cartes, I have brought with me a camera which I have adapted to the purpose. Although in the 'British Journal' (I think it was three numbers back) allusion was made to shutters fitted to the interior of a camera, which were not to overlap, no definite instruction was given as to the space to be left between them. I shall simply describe the camera before you, and also the four experiments made.

The portion of a camera in which the back slides is perforated top and bottom with two holes, in order that two shutters of zinc or wood, properly blackened, may be moved by means of brass milled heads upon the top of the instrument inwards towards the lens: the milled heads are to be sufficiently long to have a slot cut in them, which takes hold of the upper part of the flap, and can either be soldered or fitted with a screw. Of course, the one grand thing to be obviated is the dark or light line which will appear in the negative if the apparatus is not properly made. In the first attempt, the zinc doors were $\frac{1}{16}$th of an inch apart; this gave a white line as in card No. 1. Attempt No. 2 was made with one shutter placed at an angle, the other just partially shading the edge thereof; this gave a dark line. In the third trial, the shutters were made to overlap, which gave a line harder than all. I was somewhat troubled to know how I should fit an adjusting plate so as to increase or diminish the slit when the two shutters were closed: this is effected by bending a piece of metal over so as to slide stiffly upon one of the plates. In the last and successful trial, the edges of the shutters are chamfered off, and pins fitted to the bottom of the camera, so as to allow the edges almost to touch, but not so absolutely. In an instrument made for the purpose, I should certainly think that sliding pieces should be fitted with four slots and screws, in order that a perfectly central line of light may be obtained, and any necessary adjustment made. There also appears to be an advantage in having the shutters fitted at an angle instead of close to the sensitized plate. Further improvements might also be made by subdividing the perpendicular shutters, and fitting them with four milled heads for rotation; and in fact there appears to be a great range for ingenuity, if required, to produce these photographic curiosities.

Acting upon the principle that if we conquer any little difficulty, as members of a Society, we should be bound to save the time of others going over the same ground by describing it early, causes me to bring this before you. I shall also be glad to hear an explanation as to why a pencil of light, which really must act upon the plate twice the time of either exposure necessary to produce the negative, should, when brought to a minimum, not produce a line.

The pictures have been very hurriedly printed, and I have not had time to produce better. I have, however, brought the negative, which, I think you will agree with me, does not show where the junction takes place.

The Chairman, in the name of the Association, expressed the obligations they were under to Mr. Cooper, Mr. Simpson, and Mr. Bockett, and announced that the next Meeting would be held on Wednesday the 5th of April.

Mr. King said, before the present Meeting was adjourned, he would venture to express a hope that, although Mr. Dawson was retiring from the Vice-Presidency of the Association, they would still be favoured with his presence at their Meetings. Mr. Dawson had devoted much time to these subjects, and they had had some valuable papers from him; and he was sure he was speaking the feeling of every one present, when he said that though Mr. Dawson would cease to be officially connected with the Association, he would continue to give them the benefit of his experience.

The Chairman said, though retiring from office, it was not his intention to retire from the Association. He believed he should be more useful to them as a private member than in his official capacity. Whatever services he could render them they would be heartily welcome to.

The proceedings then terminated.

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The Ordinary Monthly Meeting of this Association was held at Myddelton Hall, Islington, on Wednesday, April 5. Mr. Hislop, F.R.A.S., in the Chair.

After reading the Minutes of the last Meeting, the following gentlemen were elected by ballot members of the Association:—Mr. Angle, Paddington, Mr. Mayland, Cambridge.

The Chairman said he had one rather important announcement to make to the meeting. It was that an Exhibition of Arts and Manufactures for North-eastern London was to be held in the Agricultural Hall during the ensuing autumn. The Committee employed in preparing for that Exhibition had requested this Association to take charge of the photographic department; and he hoped that the Members would embrace the opportunity to send in pictures and apparatus. Many of the Members were firstrate photographers, and this forthcoming Exhibition would afford a capital opportunity for presenting before the public some of the results of their labours without any risk of expense. Due notice would be conveyed to the Members, who should intimate, at an early period, to Mr. Barnett, the Secretary, the amount of space they would require. He wished further to call the attention of the meeting to two maps upon the table, which had been copied by means of Mr. Ross's doublet lens, the equivalent focus being 9·5 inches and 11 inches respectively. At the last meeting the subject of discussion was the new method of printing by means of chloride of silver and nitrate of silver in collodion; and Mr. Simpson, to whom they owed their obligations for his researches upon this interesting topic, had brought with him a very exquisite picture obtained by him on opal glass. The subject was one of great importance, and the meeting would no doubt be glad to learn whether any of the Members had experimented in that direction.

Mr. Simpson said, the specimen on opal glass was one produced by Mr. Swan, of Newcastle, by means of the collodio-chloride process, and had been sent up to him within the last few days.

After some inquiries had been put and answered in reference to the process,

Mr. Bockett exhibited some specimens of binary pictures produced by him, and replied to several inquiries as to the arrangements of the shutters required for producing them.

Mr. W. W. King then submitted a motion for making the next meeting special, in order to effect, in conformity with the rules, an alteration as to the periods for opening and closing the sessions of the Association.

The motion, having been seconded, was agreed to.

Mr. Cartland said, he thought that at their last meeting the Members had been somewhat remiss in not recognizing by a special vote of thanks the services of their esteemed Honorary Secretary, Mr. Barnett. He now submitted a motion to the effect that the best thanks of the Association be presented to their officers, especially to Mr. Barnett, for the courtesy and ability which he displayed in the performance of his laborious and useful duties.

The Chairman, in putting the question, said he could bear cheerful testimony to the efficient manner in which Mr. Barnett fulfilled his duties, and to the great service which at all times he rendered to the Association.

The motion was very cordially adopted.

Mr. Barnett acknowledged the vote, and said he should be always happy in doing everything in his power to further the interests of the Association. He had not been absent from many of their meetings during the last seven years; and he heartily rejoiced in their prosperity.

Mr. Aldis exhibited and explained the construction and advantages of an umbrella camera-stand which he had invented.

The proceedings were then adjourned.

Carbon Printing.

To the Editor of the Photographic Journal.

Dear Sir,—In answer to your remarks in last Journal, I am quite willing to give you credit for all that you have published in reference to my process, &c.; therefore beg to call your attention to the following facts.

You will no doubt remember that at the Photographic Society's meeting on December 7th, 1858, the subject for consideration was "Carbon Printing."

On that occasion that very fair speaker and profound reasoner, Mr. Malone, was chosen as the mouthpiece of the Council; and you will find (page 91) the report of what he termed a *résumé* of printing in carbon; and he had collected all the specimens that would bear the appellation of carbon prints, and those were various, produced from stone and metal: but if he had shown us a few old pages of your Journal, he could with equal propriety have called them carbon prints. Some specimens which he especially called attention to were some photolithographs by M. Poitevin, of Paris. The following are his words (page 93):—"I have seen a stone exposed in the garden of M. Poitevin, of Paris. It was exposed upon a stone that was perfectly colourless; it might have been white of egg and bichromate of potass. *I observe that he keeps the secret to himself.*" And then follows a paragraph of confusion worse confounded, given by Mr. Malone as the *rationale* of the process, which paragraph I proved to be absurd and ridiculous at the next meeting, by showing stones with photographs upon them; and a professional lithographer came forward from the audience, and corroborated my statements (January 8, 1859, p. 124). The report of what took place reads thus:—

"Mr. Malone: I took down your words; you said there is the same amount of detail and half-tone, and you submitted some specimens; but do you still observe that there is the same amount of *half-tone*?

"Mr. Pouncy: I am prepared to prove that now.

"Mr. Malone (examining two pictures): What is this? Is this a photograph, and this a carbon?

"Mr. Pouncy: The gentleman does not know one from the other.

"Mr. Malone: I will take your description, and not trust my own judgment. I believe that both these are ordinary photographs; I do not believe that either of them are carbon prints. Will you let me take them away and test them chemically?

"Mr. Pouncy: Yes, in the presence of any credible witness; not otherwise.

"Mr. Malone: I say, fearlessly, that if those two are shown as specimens, the one by carbon and the other by silver, I say that carbon is a very beautiful result.

"Mr. Pouncy: Sir, in all the observations that have been made, not one single carbon has been produced. Mr. Malone has very ingeniously led you round the different processes of engraving, but has not come to the point of carbon printing. Now we, as Englishmen, we think that the proof of the pudding is in the eating; and I expected to have seen a lot of carbon proofs here this evening; and yet there is not one in addition to those I have brought. Then I ask, Gentlemen, whether I am not entitled to ask the meeting to sanction the statement that the first carbon prints are produced by me, and that those produced by me tonight are equal to the silver impressions?"

To which must be added the following valuable testimony:—

"The prints exhibited were very beautiful; and even should the process never become adapted for portraits, &c., Mr. Pouncy has shown, at all events, there is a large class of interesting subjects to which it is well adapted, and in which it succeeds admirably, and is superior in my opinion to silver." (Peter Le Neve Foster, January 8, 1859, page 130.)

"Since the meeting on Tuesday last, Mr. Pouncy has kindly demonstrated by actual manipulation the facility by which his carbon-printing process may be performed. We fairly believe it to be one deserving of every attention; and Mr. Pouncy having entirely abandoned all idea of proceeding with obtaining a patent, we hope that the proposed subscription-list will forthwith be completed, so that he may be relieved from the unwilling reserve under which he is now placed, from the course which has been taken in the formation of that subscription, to which, in our opinion, he is justly entitled." ('Photographic Journal,' December 11, 1858, page 1.)

Now, Sir, I must submit to you, 1st. That my prints were not sent to the Society in the first instance until a member of the Printing Committee had solicited me to send them; and correspondence had taken place as to what I would take to give the process up to them.

2ndly. That I never have appeared before the Society or the Printing Committee as an applicant for their bounty.

3rdly. That after the method of a subscription had been adopted, and very nearly carried out independently of the Photographic Society altogether, to say that I attended the last meeting in order to make some use of the Society was unjust and absurd;" and, finally, I maintain, 4thly. That my appearance on that occasion was due to an advertisement and pressing editorial notice which appeared in the Society's Journal; and that my chief object *was to ascertain what I had long suspected*, namely, that there were no carbon prints forthcoming to meet my own.

In despite of the foregoing evidence published in your own Journal, your correspondent Mr. Crofton endeavours to make your readers believe that M. Poitevin, of Paris, had produced carbon prints previous to myself. If so, where were they? who had seen any? Does he suppose us simple enough to believe that M. Poitevin would exhibit his photolithographs, and not carbon photographs, if he could produce any? Are we to believe that the vigilance of your Printing Committee, before the time appointed, failed to obtain them, and that their mouthpiece, Mr. Malone, who gave us such an elaborate description of all the known processes past and present, and who had, as I have shown by the foregoing extracts, collected specimens from every quarter of the photographic world, and from M. Poitevin also, yet had no carbon photographs (to use Mr. Crofton's own expression)? Why, Sir, is not the proposition an insult to common sense? Yes, all my opponents failed in obtaining any carbon photographs, for the best of all reasons, because there were none in existence; and I again challenge them to prove the contrary. I give them credit for doing their best; for if ever vigilance was manifested, it was in this matter of opposing my process of carbon printing. Your correspondent may talk about specifications of patents as long as he pleases; but until he refers us to carbon photographs produced prior to mine, I shall hold the position of being the first to produce them.

The next absurdity your correspondent would have us believe, is that my offer of £5 each for any carbon photographs will never be heard of in France. How came our French neighbours to hear of my first carbon process, and to award me a silver medal and 400 francs for the same? Mr. Crofton, I dare say, supposes they have never heard (more than himself, for I presume he has never heard) of a patent process without a production.

The next accusation brought by the writer of your correspondent's letter is "my unfortunate tendency to secretiveness." This accusation I consider nothing less than a barefaced misrepresentation. Was there any secrecy when I appeared before the Society, November 4, 1862, and offered to print, from any negative, proofs in printing-ink equal to silver, as reported in your Journal (November 15, 1862, page 164)? It is a well-known fact that I invited the editors of the different photographic journals to witness the manipulation of my printing-ink process previous to the specification of my patent being published; and I appeal to yourself whether you did not receive such invitation; and as you did not come here, by your request, I paid you a visit at your own residence at Twickenham. Did I then conceal anything? And this leads me to another extract from your leader, July 15, 1863. "We have from time to time seen notices of the production of photographs in printers' ink by Mr. Pouncy. During the past week that gentleman has kindly enabled us to witness his mode of operation, and has practically demonstrated the facility with which he succeeds in carrying out his discovery, the results in each of the trials being highly satisfactory. No doubt some minor details will admit of modification and improvement; but it has been clearly shown to us that it is simple and effectual at the present time. It must be remarked that Mr. Pouncy prints direct from the negative, and that his process is not a '*photolithographic process*;' and in this he asserts his originality of invention, and which we see no reason to question. If any of our readers can enlighten us otherwise, we shall with much pleasure investigate the claim to that originality to which Mr. Pouncy, with our present knowledge, seems fully entitled."

Place in contrast with the above, the following paragraph, 'Photographic Journal,' January 16, 1865, page 185:—

"Mr. Pouncy is still struggling with his printing-ink process; he has not advanced so far, however, as to justify us in the anticipation of any very perfect results. It is to be regretted that, by laying claim to all the credit of the invention of carbon printing, Mr. Pouncy has done much to prevent the recognition of the value of his really ingenious modifications. It is well known that the principles of the process were discovered and patented, in 1855, by Poitevin; an improvement was made by Beauregard in 1857; and we heard nothing of Mr. Pouncy's process till 1858."

Now, Sir, I do not believe that *you* wrote the latter paragraph; no one who reads them both can believe it; nor do I think it gained insertion by your sanction. In justice to me, to yourself, and to your readers, you can certainly have no objection to retract it, and to admit the fact that you have still no reason to question "his originality of invention," and, so far as you are personally concerned, "Mr. Pouncy and his friends will give you credit for treating his claims with perfect impartiality."

I have no doubt that the person who wrote the paragraph in your Journal, January 16, 1865, page 185, is the same who wrote the letter, signed J. C. Crofton, in defence of himself.

Be that as it may, I think that, as you inserted Mr. Crofton's letter, copied from 'The British Journal,' you might have also inserted Mr. Fyfe's answer to the same: why not? I beg you to contrast the following extracts with the foregoing paragraph from your Journal, and a multitude of others which I need not trouble you with; but I ask in the name of truth and justice, if all other evidence is to be thrown aside, and this last paragraph believed? Is not the proposition an insult to common sense?

I shall only further trouble you with the following extracts:—

"Mr. G. Wharton Simpson exhibited some prints by Mr. Pouncy's process, in which the paper was prepared with printing-ink and a sensitive salt, exposed under a negative, and cleared by immersion in a solvent of the printing-ink, the results being a photograph in printing-ink presenting the due gradation of half-tone. The prints were examined with interest."—'Photographic News,' April 17, 1863.

"The half from which the gelatine has been removed is at least as perfect in tone and in detail as the best silver print we have ever been able to obtain from the same negative."—'British Journal,' January 13, 1865, page 15.

"Professor Moir said: I should have cared very little for Mr. Pouncy's process, had it merely given us permanency. I think, no one who has seen his best pictures, or has witnessed his experiments to-night, can entertain the least doubt that, in addition to all permanency, he also gives brilliancy of effect . . . . because, in truth, the best of them are quite equal to the silver process.

"Sir David Brewster (the chairman), addressing Mr. Pouncy, said: I have much pleasure in conveying the thanks of the meeting to you for your valuable and instructive communication, one of the most important that has ever been submitted to this Society."—Report of Proceedings before the Photographic Society of Scotland, December 13, 1864.

"We have received from Mr. Pouncy a specimen carbon print upon sheet gelatine, attached to cardboard. The definition and gradation are better than in a silver print upon albumenized paper, and the colour is extremely good."—'Photographic Notes,' January 15, 1865, page 16.

In conclusion, I must direct attention to your remarks in reference to the Jury of Class 14, and the letter of remonstrance to the Exhibition Commissioners, which you say was referred to the jury for their reconsideration. Now, Sir, I first remind you of the fact that, many years previous to the introduction of my carbon process, we had exhibitions of photographs in London and elsewhere. Did you ever have any photographs in carbon exhibited at those Exhibitions? I am sure you will answer, "No; not until we had Mr. Pouncy's."

Now mark the sequel. In course of time, after the publication of my carbon process (not before), others could exhibit carbon photographs also. Such was the case at the International Exhibition of 1862; and in my case, as in numbers of others, the original inventor is passed by unnoticed, and medals are awarded to those who follow him: hence my letter of remonstrance. These are the facts of the case, which I leave your readers to judge of by their common sense. Had I not remonstrated, the jury and commissioners might have had some excuse; but there could be none after the facts were presented to their notice; consequently their wish to do me justice was only an empty compliment. By the same rule your readers may be misled, unless this statement of facts is brought before their notice.

John Pouncy.

Dorchester, March 14, 1865.

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On the Action of Ozone upon Insensitive Iodide and Bromide of Silver. By P. J. Kaiser.

To the Editor of the Photographic Journal.

Leyden, 7th April, 1865.

Sir,—In your estimable Journal is inserted an article by Mr. Carey Lea "On the Action of Ozone upon Insensitive Iodide and Bromide of Silver." Mr. Lea gives in that article a great many experiments of great importance, and these experiments appear in contradiction with those I have briefly described in the Journal 'Les Mondes,' but in greater extent in our Auten Journal of Photography. I believe that, though the results which Mr. Lea has obtained are in appearance greatly different from those to which my experiments have led, Mr. Lea as well as myself have experimented well. Mr. Lea has, however, not made strictly the same experiments as myself. He has, in the first place, experimented with another iodide of silver. The manner in which I prepared the insensitive plate is that which M. Poitevin has somewhere recommended, and consists in preparing a plate of iodide of silver of high sensitivity, and in making that plate insensitive by plunging it into a bath of iodide of potassium in water at ten per cent., saturated with iodide of silver, under the influence of a strong light. Mr. Lea will not deny that it is very probable that the iodide of silver formed under such circumstances is of another composition than that prepared in the manner which he has described. All the iodide of potassium must be removed, otherwise the influence of ozone will have an opposite action, and the plate remains insensitive. In the second place, I have used a very great induction-apparatus, with some Bunsen's voltaic piles very strongly acting and of great dimensions; so the ozone was very strong; and such proofs as Mr. Lea has taken were naturally unnecessary, because the ozone could be smelt at a very great distance. I have also experimented with ozone formed by phosphorus; and the result was that the plate always received a veil, which, I believe, was caused by the foreign damps which must accompany the ozone formed by that substance. The ozone formed by chameleon-mineral I have never used; but it cannot be so pure as that formed by a good induction-apparatus.

Two very different circumstances can therefore be remarked: the iodide of silver which Mr. Lea used was of another nature than that which I used; and the ozone of Mr. Lea was not so pure, certainly not so strong as that which my induction-apparatus has given. Very probably many other different circumstances have taken place. I will give all my experiments, detailed in all parts, in the hope that Mr. Lea will find the same results when he takes the trouble of making the same experiments in the same manner as I have done. As soon as I have any time I shall repeat my experiments, and also those of Mr. Lea, in the conviction that they might be brought in harmony together.

In the first place, I experimented with the vapour of benzine; and the negative photographs which I have taken upon plates of insensitive iodide of silver, which were made sensitive by exposure to this vapour (with an objective for $\frac{1}{4}$-plate of Jamin), left me no doubt concerning the sensitizing power of this substance. These experiments induced me to try the effect of ozone upon insensitive iodide of silver, because I suspected that the ozone formed by the contact of benzine and the air was the principal cause of the wonderful change of the insensitive iodide of silver. So I prepared two insensitive plates, exposed one entirely, and the other partially, to a very strong ozonified air. This ozone was obtained by an ozone-tube of Geisler, while the inductor was an apparatus of Ruhmkorff, one of the greatest dimensions that Ruhmkorff ever brought into commerce. The plates were exposed only a few minutes to the ozone. I exposed the plates, an hour after this operation, for a few seconds under a negative photograph in full daylight. The development gave an intense image, except on those parts of the iodide-of-silver plates which the ozone had not touched. After some time, I experimented with another induction-apparatus of Ruhmkorff of much smaller dimensions than the former. The effect was also much less, and the plate wanted an exposure of several hours to obtain a notable alteration of the insensible iodide of silver. I prepared another time three insensitive iodide-of-silver plates. I exposed one to ozone, formed by an ozone-tube constructed by myself, according to the directions of Prof. Babo, and the smaller induction-apparatus named above. I placed a second in a dark room, while the third was placed in the full sunshine. The following morning I exposed the three plates behind the same negative photographs I used in the former experiments—the first for ten seconds, the second for twenty seconds, and the third for sixty seconds. All these plates gave good images; also the third, that came from the full sunshine, was immediately exposed to a much less intense light behind the negative photograph. This singular phenomenon was afterwards again observed by me, but I changed the experiment in such a manner that I placed the insensible plate, coming from the full sunshine, immediately in a camera. I exposed nearly one minute, while the camera was directed upon an object that was lighted by the ordinary daylight in an atelier. The object was a figure made of plaster. The development gave a very faint image, but yet an image that was distinct enough to constitute the former singular phenomenon. At first I believed that the plate was not quite insensitive by the process of M. Poitevin; but an exact examination of the photographs made with these plates gave me the conviction that they were so indeed. All the parts upon which the light going through the negative photograph, or through the objective of my camera, could not work, had remained wholly pure, and no fog was caused by a very long development.

I used in all these experiments a collodion iodized only with iodide of cadmium; and the liquid for the development was the well-known citric-pyrogallic acid solution ordinarily used in the collodion process. Mr. Lea seems to have used by preference the sulphas oxyduli ferri*. I believe that with this energetic developer it is necessary to take a great many precautions, which it is very difficult to define. My experiments have only relation to the action of vapours upon iodide of silver. That of these vapours upon bromide of silver must be of quite a different nature.

I believe, sir, that Mr. Carey Lea will have no doubt as to the authenticity of my experiments, when you have the kindness to insert this letter in your Journal, and he takes knowledge of their details. Nevertheless the results which Mr. Lea will obtain, if he would repeat my experiments in a similar manner, may still be different from those here described. I hope that the experiments of Mr. Lea will lead to other discoveries, and will spread more light over the singular phenomenon which I have published.

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* Sulphate of iron.

Gutta-percha and India-rubber.

Mr. Spiller, of the Royal Arsenal, Woolwich, has made some curious discoveries in reference to the lasting qualities of gutta-percha and india-rubber. He finds that in process of time these substances gradually alter in character, until they become of a resinous nature. This fact is interesting to photographers, inasmuch as many of their utensils are made of these materials, and, what is of more consequence, the so-called patent albumenized paper is partly prepared with a solution of india-rubber, the prints upon which are consequently in a continual state of change; and where change is always going on, permanency cannot exist. We extract the following from the 'Chemical News':—

"This material [Patent Waterproof Felt] serves the purpose of a cheap packing, and is used in the exportation of silk and other valuable fabrics, stationery goods, and many articles which are liable to be affected by damp; it is sold in sheets of great length and about a yard wide, and appears to be made by cementing or matting together the fibres of cotton wool through the intervention of india-rubber paste or solution, so that after the evaporation of the coal-naphtha or other solvent, and passing through rollers, a continuous and water-repellent fabric is produced. About six years ago Mr. Spiller purchased some of the waterproof felt, and made some useful applications of it in the way of photography; some of the material had, however, been laid aside until recently, when, upon examination, it proved to possess no longer the strength, close structure, and waterproof qualities of the original article. Finding this to be the case, the properties of the aged material were compared with a sample of recent manufacture, and the altered fabric examined in the same manner that it had been tested six years ago—viz. by extracting the rubber with benzole, and noting the character of the film left upon the evaporation of the solvent. When thus treated, the original fabric furnished a beautifully white cotton flock and a solution which, being evaporated, left a perfectly elastic film of pure india-rubber; and the same results were obtained upon the examination of the newly manufactured sample; but, on the other hand, the altered fabric, when treated with warm benzole, gave a discoloured cotton and a solution which left upon evaporation a resin or brownish-yellow brittle substance closely resembling shellac. The chief examination of this interesting product was made upon the material extracted from the fabric by warm alcohol, which left insoluble, besides the cotton, a small quantity of unchanged rubber easily separated by filtration; and the amount of the brittle resin procured in this manner from a square foot of the fabric weighed, after complete evaporation of the solvent over a water-bath, 74 grains. A considerable quantity of this altered india-rubber was thus prepared, and its chief properties were the following:—It is freely soluble in alcohol, especially if warmed, in wood-spirit, chloroform, and in benzole, as already stated. It is not appreciably soluble in ether, bisulphide of carbon, or oil of turpentine. Alkalies dissolve it with ease, and it may be reprecipitated from such solutions by neutralizing with acids. Like india-rubber itself, it becomes bleached upon immersion in aqueous ammonia. The resin fuses below the temperature of boiling water, and when strongly heated in a retort gives off an amber-coloured oil of agreeable empyreumatic odour, besides furnishing water—a proof of its containing oxygen. At ordinary temperatures it is extremely brittle and highly electric, so much that it cannot be powdered in an open mortar without loss. When rubbed with silk the substance exhibits the phenomena of 'resinous electricity.' An analysis of the resin was made by combustion with oxide of copper, which indicated the following percentages:—

Carbon	64·00*
Hydrogen	8·46
Oxygen	27·54

For reasons adduced by Dr. Hofmann in the case of the altered gutta-percha examined by him, Mr. Spiller abstained from constructing a formula, merely regarding this substance as an oxidation-product formed directly from caoutchouc by the absorption of atmospheric oxygen, in much the same manner that resins are formed from essential oils and other hydrocarbons."

Method of Photographic Copying without Silver.

By Johann Obernetter.

Ordinary paper is laid with its least-smooth side on a solution of 13 parts of sesquichloride of iron (sp. gr. 1·53–1·60), 100 of crystallized chloride of copper, and 12 of pure concentrated sulphuric acid in 1000 of water, and left floating for about two minutes. It is dried in the ordinary manner, by suspension from the two corners. This may be done without detriment in diffused light; and the paper may be preserved for years. After copying, the picture is either not visible or appears on the paper as a faint

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* In writing these numbers upon the board, Mr. Spiller placed in comparison with them the figures representing one of Dr. Hofmann's compounds from gutta-percha, viz.:—

Carbon	62·79
Hydrogen	9·29
Oxygen	27·92

yellow. The picture is fixed and made visible by a solution of 8 to 10 parts of sulphocyanide of potassium and 1 part of concentrated sulphuric acid in 1000 of water, and about 10 to 20 of the preparation-liquid. The paper is laid with the picture-side downwards on the liquid, and left floating for three or four minutes, then completely immersed, a second copy placed on it, and so on. By the action of this solution on the exposed paper, sulphocyanide of copper is deposited on those parts on which the light has acted, to an extent proportional to the action of the light. Even the finest half tones are not lost. The time necessary for the picture to remain differs with the method which is to be followed subsequently; it varies between five minutes and half an hour. But if the picture remain longer in the liquid—for instance, twenty-four hours—a relief forms. The author has obtained shades of two lines in height by this method. After the picture has been taken out of the solution, it is placed in ordinary water, and left for from a quarter of an hour to a day. An hour is in all cases sufficient. To make the following changes in the picture, it may be dried without detriment.

There are various methods of altering this sulphocyanide-of-copper picture. It is laid in a solution of yellow prussiate of potass (6–12 per cent.). The picture begins to colour red, which continually becomes more intense; if it remains over night, it acquires a splendid, velvety, deep red colour, with quite clear lights. An hour is sufficient for acquiring the tone generally liked. The picture is then washed with water, until the latter no longer runs off yellow (a quarter to half an hour, if the water is frequently changed). It is then laid in a solution of 100 parts sulphate of iron, 40 sesquichloride of iron, and 80 hydrochloric acid in from 200 to 300 of water. The colour changes from red to reddish violet, violet, black, and greenish black. As soon as the desired colour is attained, the pictures are washed with acidulated water and dried. The author produced the most beautiful purple-violet pictures by leaving them so long in the iron solution that they became greenish black, then washing them somewhat, and a short time afterwards allowing a very dilute solution of acetate of lead to act upon them. To give them the appearance of albumen pictures, he allowed them, after drying, to float on albumen, and coagulated this. By this method he could produce pictures of the largest size, which even by the most celebrated photographers were considered to be beautiful silver pictures. The author thus explains the chemical actions involved in this method:—

1. Upon the paper are $Fe_2\,Cl_3$ and Cu Cl, the latter in excess. By the action of the light, and proportional to the transparency of the negative, $F_2\,Cl_3$ is reduced to Fe Cl. As yet Cu Cl is not reduced. If, immediately after the copying, the paper is brought into an absolutely dry space, the picture remains. In moist air, the Fe Cl formed absorbs moisture, and decomposes with water in such a manner that again $Fe_2\,Cl_3$ and $Cu_2\,Cl$ are formed. If the picture, after this reaction is set up, is not soon brought into a sulphocyanide solution, the $Cu_2\,Cl$ formed is again changed into a higher chlorine-compound, and the paper is again fit for copying. But if the picture, so long as there is Fe Cl or even $Cu_2\,Cl$ present, is brought into the sulphocyanide solution, subsulphocyanide of copper is immediately deposited upon the reduced part, while sulphocyanide of copper is formed on the unreduced parts; this dissolves in the excess of sulphocyanide of potassium, decomposes with water into subsulphocyanide, and is deposited as such on the parts already covered with this salt. The picture is often yellow on coming out of the solution. This corresponds to the formation of a subsulphocyanide of copper. The yellow colour disappears in water, inasmuch as the salt, in this fine state of division, decomposes with water, forming sulphocyanide of copper. Reddening of the picture is caused by its conversion into ferrocyanide of copper. Violet is produced by a partial formation of Turnbull's blue.

2. The author produced carbon pictures from the subsulphocyanide picture, by partially drying the picture after it was taken from the wash-water, and leaving it for a short time in an atmosphere of chlorine or in a mixture of chlorine and oxygen: in this way chloride of copper is again formed from subsulphocyanide. It is known that paper, in places where it is impregnated with metallic solutions, easily carbonizes, but can otherwise resist a very high temperature. Paper impregnated on the surface with chloride of copper, like this, carbonizes at a temperature of 150–170° C. For this purpose, the author places the pictures in a sheet-tin box, which he heats to nearly 200° C., and the picture then appears with the finest middle tones in a chestnut-brown colour. The paper becomes brittle, but has so much firmness that it can be pasted on a second piece of paper without danger of tearing.

3. By Phipson's method, the well-known brown colour can be produced by immersing the pictures, as they are taken out of the water, in an ammoniacal solution of permanganate of potass. It is not necessary that the copying last so long as in the former case. A dilute solution of nitrate of silver also yields nice

pictures. The copying need only be very short. Addition of acids alters the tone. By washing with water which contains some oxalate of ammonia, they are fixed in a pretty, velvety manner.—*Photograph. Archiv.*

Schnauss remarks upon this paper, that he has tried all the methods recommended by the author, and that although they require more practice and skill than the ordinary chloride-of-silver method, it is not difficult, with a little patience and attention, to obtain satisfactory results.—*Polytechn. Centralblatt*, 1864, June, S. 737.

The Price of Magnesium.—This remarkable metal, which has lately proved of such singular service to photography, has just fallen at one drop from 25*s.* per ounce to 12*s.*—a reduction of more than 50 per cent. In quantities of five ounces it may be purchased at 10*s.* per ounce. It may be presumed that the increasing demand had enabled the company which works Mr. Soustadt's patent to produce the metal on a larger scale at a cheaper rate. Its employment for other purposes than photography may be considered near at hand.

It has been determined that the future Meetings of the Society shall take place on the second instead of the first Tuesday in each month. This decision has been come to chiefly that the report of our own, as well as the proceedings of the Photographic Society of Scotland, should appear as soon after the respective Meetings as possible. The day of publication of the Journal will remain the same.

Erratum.—Page 24, line 35, *for* "Mr. Wood" *read* "Mr. How."

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

⁂ In consequence of several applications to the Editor, he begs to state he has never in any way been connected with the Polytechnic Institution, or with any photographic establishment, either there or elsewhere.

P. E. (*Kinross*).—It is not needful to apply for space at the approaching Exhibition of the Photographic Society. All works will be admitted which in the opinion of the Committee are qualified.

J. S. and others.—The Committee have come to the determination that they are unable to exhibit apparatus, in consequence of the limited space. Any remarkable objects would be most acceptable for the *Soirée*, to be held on the 8th of May. The medals are restricted—not to exceed six. These need *not* be given, unless in the opinion of the Committee the excellence of the subject demands the distinction.

A Member asking for information.—We cannot, on authority, answer your inquiries,—our individual opinion being that the Committee *may* award a medal for any discovery which has been made for the good of our art. We think also such a course would be only a just acknowledgment for any paper which has been read before the Society, giving any new and important process. We give the following extract from the Minutes of a Council held in 1863, which will be found to provide for such a distinction:—"The Secretary asked that the Council would sanction another medal to be struck, to be called 'The President's Medal,' having on the obverse the likeness of the President; the medal to be given at any time to those whom the President and Council shall deem worthy of reward for any remarkable discovery, improvement, or application of the photographic art." The subject having been discussed, and the Secretary stating that he would undertake to accomplish this by subscription, without calling on the funds of the Society, the words "or other meritorious object" being added, the proposition was unanimously sanctioned. From various causes, which cannot be here explained, no contributions have been received or asked for; but, by the generosity of Mr. Durham, a model for the medallist will early be obtained, when a subscription-list will be opened.

A Member.—We have made especial inquiries into the neglect *said* to have taken place. The Journal was, in the first instance, sent to the address given at the time of election. Since, it has been forwarded to the *new* address, and has not been returned to the publishers. We can do no more. 2ndly, If a Journal is constantly sent to the usual address of a deceased member, it would be but civil and right to intimate a fact of which the publishers, collector, and secretary are all ignorant.

Amateur, E. K.—The printing process of Mr. Simpson has entirely satisfied several of our friends, one of whom considers it "a great gift to photographers." There seems to be no difficulty in coating full-size sheets of paper. We have seen some portraits usually called "whole-plate pictures," and they are quite perfect.

Foggy.—In developing a collodio-albumen plate according to Mr. Mudd's method, if, after applying the plain solution of pyrogallic acid, the image does not appear, the plate may be plunged into warm water, which will facilitate the developing. You only obtain a weak phantom image with the pyrogallic used without acetic or citric acid and silver: it should be intensified with the ordinary developer.

A. F. F.—Col. Stuart Wortley has a glass house built on a modification of such a construction as you propose. If you personally communicate with him, no doubt he will explain to you the advantages and disadvantages. We again repeat, you had far better adhere to the old and more economic plan. Glass of good stout quality is always cheaper than bricks and mortar. Get all the light you can: you can diminish when you cannot add.

No. 157. MAY 15, 1865.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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PHOTOGRAPHIC SOCIETY.

The next Ordinary Meeting of the Society will take place at King's College on Tuesday, June 13th, at eight o'clock, when a paper will be read by Mr. Pettitt on "Binographs."

Members may still obtain the photograph of "Bringing Home the May," on application to Mr. Mattress, at Messrs. Taylor & Francis's, Red Lion Court, Fleet Street.

Meeting of the Society.

1865. Tuesday, June 13

The annual *Soirée* of the Society took place on Monday, the 8th instant, in the Exhibition-rooms in Conduit Street, and was one of the most successful gatherings of the kind which have ever occurred under the auspices of the Society. A novel feature was introduced at this *soirée*. It has always been usual to show photographs on the walls; but this time the process of taking them was shown and explained by Mr. Skaife, who attended with his pistolgraph and took portraits with it, by aid of the magnesium light, throughout the evening, with great success. One of the most popular attractions of the evening was the exhibition of magic-lantern slides, in a room devoted to that purpose.

Dr. Maddox's wonderful series of micro-photographs were exhibited by Mr. How, and, with the collection of wild animals taken last summer by Mr. Haes in the Zoological Gardens, gave very decided satisfaction. Mr. Hart shed the dazzling and silvery light of the magnesium wire over the assembled guests at intervals by the aid of his ingenious lamp; and Mr. Meagher lent an elaborately carved and beautiful cabinet stereoscope, which he had made expressly for the occasion. The London Stereoscopic Company supplied some of Mr. Rowsell's patent graphoscopes, with a collection of pictures for exhibition in them.

The company, amongst whom were the Lord Chief Baron, President of the Society, and many of the celebrities of the literary, scientific, and artistic world, was estimated to number about 700; and there appeared to be a general feeling of surprise that so good an exhibition as that in which they were assembled could have been got up at so short a notice as that which the Committee who had the management of it were able to give.

◆

Major Russell's paper, read at the Meeting on Tuesday night, is a record of some of the most interesting contributions to dry-plate photography which have been presented to the public; and that record was illustrated by the best of all vouchers for the excellence of the process—a number of specimens, both negatives and prints, of instantaneous and other pictures.

The paper of Major Russell contains a very excellent *résumé* of the progress of the tannin process, and the discovery of new principles and facts connected therewith, made both by himself and other workers in the same field. The principle of developing without the use of any free nitrate of silver, first discovered by Mr. Wardley, which, when promulgated a few years ago, was met with denial or inattention, is now thoroughly proven. Mr. Leahy's discovery, two or three years since, that tannin plates could be developed with ammonia alone, and without free nitrate of silver, has expanded, in the Major's hands, into a practical process of development in which free nitrate of silver takes no part, not only in the formation of the image, but in producing the vigour and density necessary for printing-purposes.

The long-disputed question as to the value of bromide in collodion is now entirely set at rest by the production of instantaneous pictures by plates prepared with bromide alone, without any iodide whatever. The secret process by which dry plates capable of receiving instantaneous impressions, which has been so carefully guarded by Dr. Hill Norris, is now no longer a subject for the longing curiosity of photographers, as a process is published by which similar results can be attained.

It is perhaps to be regretted that the paper was somewhat wanting in precise formulæ and details of manipulations, the more so as the results exhibited were undoubtedly such as to render photographers desirous of following out the experiments suggested by the author.

Photographers are much indebted to men like Major Russell, who for years follow out with patience and assiduity certain experiments, devoting their whole energy and time to the elucidation of some one important point or process, and then freely and without reservation presenting the results to the public as a contribution to the general stock of knowledge.

◆

OUR attention has been called to the following passage in a letter from Miss C. Bertolacci, eulogizing the productions of herself and sister, to the editor of the 'Photographic Notes'; and as it contains an unwarrantable attack on the Committee appointed by the Council to superintend the Exhibition of 1864, we feel bound (notwithstanding our reluctance to comment upon the statement of a lady, however ill-judged) to notice it.

> "Now, on the subject of photographic reproduction as a special branch, and perhaps the most difficult to effect in perfection, and which we have adopted as our main occupation; after our works have been noticed for the last three years by daily and weekly papers, the 'Photographic News' takes upon itself, in a recent number, to be the first to suggest these artistical reproductions, wilfully ignoring all our steady and uninterrupted labours, while it lauds up certain foreigners, and Mr. Thurston Thompson, for having exhibited a few of the best of his '*cribs*' or scraps from some of Turner's works. They would, perhaps, say that, beyond our 'Liber Studiorum' (which they had no right to ignore), *we* had not exhibited our works; but the fact is that after Mr. Thurston Thompson had obtained a prize for reproduction-photography, he became a member of the Committee, which, on seeing a much superior order of reproduction effected, suppressed all the prizes of competitors for that order of photography. We consequently went on doing our work for the public, and left the exhibitions and intrigues to their cliques and coteries."

The first part of the paragraph, referring to the 'Photographic News,' it is not within our province to notice. Our contemporary has explained that it is no part of his duty to notice every photograph that is published, whether it be forwarded for review or not, and it is no part of a respectable journalist's duty to *tout* for objects on which to exercise his functions as a reviewer, although we are sorry to find that such a practice obtains amongst the "tag-rag" of the literary profession. It is with that part of the statement referring to Mr. Thurston Thompson and the Committee with which we have to deal.

Miss Bertolacci accuses the Committee, or, in other words, the entire Council of the Photographic Society, with having suppressed a Medal for reproduction because Mr. Thurston Thompson had already had one, and because they saw that a much superior order of reproduction (her own!) than what she is pleased to call Mr. Thompson's "*cribs* or scraps from Turner's works," had been effected!

It is well known to all interested in photography that Mr. Thurston Thompson stands incomparably in advance of all others in this country in the branch of reproduction. A pupil of Mr. Bingham, who is by all admitted to be unrivalled in the world in this department of our art, he has brought to bear an amount of art-education, fine taste, and skill in manipulation, together with long practice in the higher branches of reproduction, which have enabled him to take and retain, hitherto unchallenged, the proud preeminence to which we have referred. In the year 1863 he contributed to the Exhibition of this Society a large number of specimens of very difficult subjects, possessing a degree of beauty and faithfulness to the originals which had until then been thought unattainable in that direction. For these he received the Medal by the unanimous consent of the Committee of award, as well as the universal verdict of the public. In the same Exhibition Miss C. Bertolacci exhibited some copies, not of Turner's paintings or drawings, but of the engraved edition of the 'Liber Studiorum.' These, although examples of what is usually regarded as the lowest walk of photography—the reproduction of prints in black and white—were dark and heavy, and suggestive of the fact that they were copies of worn out-impressions of the plates. In the following year, when the Council came to consider the question of

Medals, it was determined that, seeing one gentleman so far outstripped his fellows in this branch, there was practically no competition; and it was determined for this reason that no Medals should be awarded to reproductions. For a like reason, combination photographs were barred from any Medal, as it was alleged that one gentleman alone had any chance in the competition. The justice of these decisions has since been considered open to question. Mr. Thurston Thompson, however, accepted office on the Exhibition Committee, and gave a large amount of valuable labour in bringing to a successful issue an Exhibition in which he was debarred from possessing a competing interest. Nothing could be more ridiculously absurd than the conception that a Medal for reproduction had not been offered because the Council of the Photographic Society had seen a higher style of reproduction effected. The productions of the Misses Bertolacci cannot be considered, even for a moment, comparable, either in difficulty of achievement or in excellence of result, with those of the gentleman whose works they affect to decry. They are indeed to Mr. Thompson's reproductions

> "Are as moonlight unto sunlight, and as water
> unto wine,"

and could never, except in the roseate hue of self-love, have been regarded by any one as competing, even at a great distance, with Mr. Thompson's well-known copies of Turner's paintings.

It is with regret that we are compelled thus to speak plainly of the productions of two very pains-taking ladies; but justice to the Council of the Photographic Society, and the necessity of rebutting a gross charge of intrigue and favouritism, render this disavowal of such motives necessary. We regret still more that the absence of judicious editorial restraint did not save these young ladies from being guilty of a blunder which their best friends must lament.

PHOTOGRAPHIC SOCIETY OF LONDON.

ORDINARY GENERAL MEETING.

KING'S COLLEGE, LONDON.

TUESDAY, MAY 9, 1865.

J. GLAISHER, Esq., F.R.S., V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following gentlemen were elected, by ballot, Members of the Society:—

J. W. RIMINGTON, Esq., Rockbeare House, near Exeter.

JOHN A. ROWLAND, Esq., Fairlight, Hampton Wick, S.W.

KETTERVILLE BRIGGS, Esq., Parade, Leamington Priors.

Major RUSSELL read a paper

On Dry-plate Photography

IT is my purpose in this paper to describe some new facts and principles in dry photography, in the first place giving a brief outline of my experience in the matter from the first, to show how I have been led to my present opinions.

My first attempts in the dry way were with Taupenot's process, on its first publication; they were quite successful, but I soon found that a final wash of gallic acid made the development more rapid, and gave a brighter and better image. The nitrate of silver was not entirely removed, and superficial stains and smears were sometimes produced; this evil was prevented by a change in manipulation, but it was found that the plates would not keep, yellow stains soon appearing round the edges of the plates. The next thing tried was a bath of salt and water to remove the nitrate chemically, and then well washing to get rid of the salt before applying the gallic acid. This plan answered so well that the principles involved have since been kept in view as those most likely to lead to a really good dry process. Although until very recently I have made occasional trials of dry methods which depended on the presence of a trace of nitrate of silver, the results have only confirmed me in the opinion that this is not the right way of working, and in fact may be said to belong to the dark ages of photography. The collodio-albumen process, although it gave excellent results, was found to leave something to be desired. The worst fault inherent in it is the liability to stains from the adhesion of scum on the bath to the dry absorbent surface of the albumen, which is not protected, like collodion, by the repelling action of ether. It has been recommended to rub off these stains during development; but this is not a very satisfactory process, being tedious and troublesome, and apt to damage the film.

Nearly all the dry processes which were well spoken of were tried, and succeeded best when the nitrate was completely removed and gallic acid mixed with the preservative or used as a final wash; but the fault of all was that they made success too much dependent on the mechanical and chemical state of the collodion. At last I thought of substituting tannin for gallic acid, mixed with gum-arabic, at first in small proportion: the result showed immediately that tannin had greater capabilities than anything else which had been tried; and it was used in larger proportion, and then without the gum.

Tannin has been said to be a sensitizer, and from the result of some recent experiments this seems really to be the case; collodion, which will scarcely give a trace of an image when simply washed and dried, will produce a good negative when the tannin has been applied after drying the film, but before exposure, while the application of tannin after exposure has scarcely any effect. Many other soluble organic matters have the same property, and it is not improbable that something better may be found; but as yet I have tried nothing which has answered half as well. The first difficulty in working with tannin was that the film, on being moistened, though it did not blister, expanded and formed wrinkles; this was prevented by a thin substratum of gelatine, which, when partially coagulated by the tannin, held the collodion very firmly to the glass. A simple means of diminishing the tendency of the film to expand was discovered, I believe, by Mr. Bartholomew—that of moistening the film, before developing, with a mixture of alcohol and water.

It was soon found that the presence of bromide in unusually large proportion in the collodion increased sensitiveness, and eventually that a still further increase might be obtained by the use of bromide exclusively. In the course of making experiments in a direction pointed out by Mr. Keene, it was found that washing off the tannin after application increased sensitiveness, greatly diminished the tendency of the film to expand, and did not remove the chemical effect of the tannin. Another discovery, made near the same time, was that of the alkaline developer. Accounts were published of fuming tannin plates with ammonia in America; this was said to increase sensitiveness; and next it was stated that the fuming answered equally well after exposure, and that the image was rendered visible. It seemed to me quite evident from these facts that ammonia and tannin acted as a developer; and as it appeared probable that pyrogallic acid would act more energetically, the first experiments were made with it. On mixing ammonia and pyrogallic solutions no immediate effect was perceived; but the mixture gradually became discoloured, exactly as if nitrate of silver and an acid had been used; this looked promising, and it was found that, when the fresh-mixed liquid was poured on to an exposed plate, a powerful developing action was set up.

It would be a great mistake to suppose that ammonia is a developer, except in the same sense that nitrate of silver is so; a mixture of ammonia with tannin, gallic acid, or pyrogallic acid will develope, far most powerfully when the last is used. The action of ammonia in this way bears a very close resemblance to that of nitrate of silver. The method just indicated, of using bromide alone, washing off the tannin, and developing with an alkaline mixture, was published before there had been time to test it thoroughly; it worked well at first, but it soon appeared that some condition of success was unknown. During some weeks of constant trial, almost the only difficulty was occasional want of sentiveness, which was rightly attributed to the insufficient removal of soluble bromide; and it being supposed that none of it should remain in the film, the collodion and treatment were altered a little to make the removal of the salt more easy and certain. The result was that the negatives were almost always more or less fogged, with exceptions of great brightness and vigour, which made the matter very puzzling. At last it was evident that the uncertainty was caused by the difference in the duration of the stay in the exciting bath and washing-water, and the conviction was forced on me that bromide of silver is discoloured by a developer, without the action of light, when no trace of a haloid salt is present.

This fact having been proved beyond all doubt, it was necessary to make a careful investigation anew of several questions, especially of those relating to the behaviour of iodide and bromide of silver, and of the soluble iodides and bromides. In these experiments a pure collodion was used, which would scarcely give a trace of an image when simply washed and dried without nitrate of silver or tannin. The results obtained from many courses of experiments were as follows:—it was found that washing off the tannin gave a real increase of sensitiveness, which was not due to the more complete removal of soluble salt. On comparing the sensitiveness of iodide and bromide of silver, when each was treated in the manner which seemed best suited to it, the iodide proved to be between fifteen and twenty times less sensitive than the bromide, and it was found that the alkaline developer had little or no effect on the iodide; in fact the image produced in this way was so faint as to be almost invisible, and it seemed probable that it was not produced by any action on the iodide, but on some other combination of silver in the collodion; this point, however, was not tested. When the development of a plate prepared with iodide only was begun with the alkaline liquid and finished with pyrogallic acid and silver, the result was inferior in every respect to that which was obtained by using a silver developer from the first. The iodide of silver did not, as far as it was tried, appear to require the presence of any soluble salt, the negatives being equally bright whatever the duration of exciting and washing. To obtain a tolerably good negative with iodide alone, it was necessary to expose until a visible image of the sky appeared before development; from this it seems likely that the insensitiveness of the iodide may be due to the fact that no known developer is suited to it when entirely freed from nitrate and dried; it is possible that the discovery of some new developer may give us a high degree of sensitiveness with iodide of silver.

Bromide of silver, besides its sensitiveness, has another valuable property: instead of, like iodide, coming out to meet the nitrate, and thus forming a superficial layer composed almost entirely of the silver salt, it is converted where it lies, uniformly, or nearly so, through the whole thickness of the film. This property enables us to use so large a proportion of bromide in the collodion that its contractile property may be entirely removed; and thus any tolerably good soluble cotton will answer, and one of the greatest difficulties in dry photography is avoided. Another result is that no loose layer of bromide of silver is formed on the surface of the film; even with a very large proportion of bromide in the collodion, the surface is always bright when dry, and will bear brushing with cotton wool without showing marks.

For some time it appeared as if a small proportion of iodide of silver was of some service; for one part of iodide to twelve or fifteen of bromide in the collodion gave an advantage in making it more easy to obtain the proper combination of sensitiveness and brightness; it turned out, however, that this effect was entirely due to a trace of soluble iodide, and not to the iodide of silver. In investigating the properties of soluble iodides and bromides, it appeared that not only were the former more energetic, but their effect was more permanent; for instance, a plate, after exciting and washing, dipped in a forty-grain solution of bromide was easily restored to its full sensitiveness by washing and applying tannin, while, with the same treatment, a plate which had been dipped in a $\frac{1}{10}$-grain solution of iodide would be insensitive and the image feeble and foggy. Increasing the strength of the iodide only aggravated these evils, till a solution containing $\frac{1}{2}$ a grain or more of iodide to the ounce made the film almost entirely insensitive and incapable of even fogging; in fact it was almost entirely unaffected by a developer after any ordinary amount of washing and exposure*. This looked unpromising enough, but nevertheless a very slight trace of soluble iodide, either in the collodion or introduced in a subsequent washing, gives an advantage, as when present in the right quantity it tends to prevent fog, and is not easily removed by washing. I have been led to suspect that a minute trace of soluble iodide gives some other advantages, but am not certain about this.

One very curious result was obtained while testing the effects of small quantities of iodide in the collodion; 16 grains of bromide of cadmium were dissolved in 10 drachms of collodion, a second portion had 15 grains bromide of cadmium and 1 grain iodide of cadmium; in each of several other portions another grain of iodide was successively substituted for one of bromide. A plate coated with each sample was excited and washed to the extent which best suited the bromide alone; on being developed, the collodion containing 1 grain of iodide was less sensitive, but brighter and more intense than that containing only bromide, while further additions of iodide made the plates as sensitive, but less intense than that prepared with bromide only, and the greater the quantity of iodide the less was the intensity. This occurred in two or three sets of plates, but the result seemed so strange that it was thought that some mistake might have been made in the preparation of the collodion. Accordingly fresh samples were made and tried, but with precisely the same result. The only way in which the phenomenon can be accounted for seems to be this: when a very small proportion of iodide is used, a trace of it remains unconverted with the unaltered bromide at the back of the film, but a larger proportion is all converted by the strong bath which suits the bromide. It appeared also from other experiments that the only effect of iodide of silver in my present way of working is to diminish intensity, and I feel convinced that it is totally inert, as much so as brickdust would be. A moment's consideration will show that this is likely to be the case; for the iodide is not only about eighteen times less sensitive than the bromide, but is incapable of being developed by the alkaline mixture, and the soluble salt required with the bromide still further tends to make the iodide of silver inert. The only useful purpose served by the iodide is to aid in preventing the transmission of light.

One of the most recent improvements has been the use of albumen: my attention was called to this by the late Mr. Glover, who told me that he found albumen mixed with the tannin tended to prevent, or rather to diminish the size of spots on the negatives. It so happened that I had a short time before tried a somewhat similar plan, using the albumen after the tannin, but found that sensitiveness and intensity were both diminished, though the image was bright and the film very free from defects. On trying Mr. Glover's method the same result was obtained, as I expected; but a bath of very weak solution of albumen before the application of the tannin produced a very different effect: the albumen still acted like size on paper, preventing the spread of noxious soluble matter left in pores of the glass, but it gave a tendency to sensitiveness and fogging; in fact it seemed to form some combination which required more of (and, so to say, neutralized) the soluble salt, too much of which is apt to remain in the film, and so made it easier to obtain full sensitiveness, much less washing being required. This effect does not depend on any combination with nitrate of silver, as it is not diminished by previously dipping the plate in strong solution of bromide. The sensitiveness seems to be about the same, with or without the albumen, when the proper conditions are observed in both cases; the albumen always retards the development and diminishes intensity a little, but makes the colour of the image more non-actinic, so that, after the same amount of development, probably about the same printing-power is produced when the albumen solution is not too strong; not more than one part albumen to 96 of water should be used, or the retarding effect will be too great. The weak solution of albumen has several different effects: it makes the film closer in texture, and prevents the too easy washing out of soluble salt introduced with it. It is usually necessary to dissolve some bromide, or a trace of iodide, or both, with the albumen; this makes the quality of the plates almost entirely independent of the duration of the exciting and previous washing. The albumen will sensitize the bromide of silver like tannin, though much more feebly; but when the albumen is applied with or after the tannin, all effect in sensitizing and neutralizing the soluble salt is superseded by the greater energy of the tannin. Although the albumen is by no means necessary, it seems to be quite worth the little extra trouble it gives; negatives produced in this way have something of the character of albumen pictures. The albumen should be well washed off before using the tannin.

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* In these experiments the films were not exposed to the light during the preparation.

The result of the examination into the effects of soluble iodides and bromides seemed to show that their office is to restrain the alkaline developer, in much the same way that acid acts in a silver developer. After many months of investigation with a view to find some absolutely certain way of securing the presence of exactly the right amount of salt in the film, I must confess that I cannot find any; in this, as in many other things, there is no royal road to success. It is difficult, if not impossible, to know when the whole of the soluble salt is removed; and when it is so, it is not advantageous to use all the salt in a final wash or in the developer, as a sufficient quantity to prevent fog in the back part of the film diminishes sensitiveness on the surface very considerably. This being the case, no definite rule can be laid down, and the treatment must vary with circumstances; the more porous the collodion the more easily can the soluble salts be removed. When the necessary condition, however, is understood, there is no great difficulty in keeping about the right amount of salt in the film; and if all the plates in each batch are prepared as nearly as possible alike, errors in the preparation may easily be corrected in the development within wide limits. If too little salt is left in the film, some must be used in the developer; if too much is present, more ammonia may be added drop by drop to the developer; and if this does not quickly bring out sufficient detail, the plate may be washed and a new developer applied. In the former case the first plate will probably be spoiled, and it is therefore better to have too much than too little salt in the film; when fogging to any extent is once started, it is very difficult to bring out an image good for anything. Any great deficiency or excess of soluble salt in the film is unfavourable to sensitiveness, even when the error is corrected in the development.

One of the most important improvements made recently is a method of intensifying without nitrate of silver. When the detail is out sufficiently, following the analogy of the ordinary silver developer, strong solution of ammonia containing a sufficient amount of soluble bromide to prevent fog may be added to the developer; and if the film is in the right state, even more intensity than is required may be easily and quickly obtained; when more salt than is necessary has been left in the film, the addition of ammonia to the developer to bring out detail will often at the same time produce sufficient intensity. To obtain intensity without nitrate of silver, the requisite conditions are, that fogging to any extent should not have commenced, and that the layer of sensitive bromide of silver should be sufficiently thick. It is evident that if the film is translucent before being darkened, it will not be very opaque when blackened all through; for in this method no silver can be deposited on the image, which is formed by the reduction of the bromide of silver to the metallic state; at least this appears to be the case by tests which have been applied. This state of things is really a great advantage; for all "piling up" (which often occurs in the ordinary way to so injurious an extent) is entirely avoided.

The facts just described entirely contradict the old theory of development, so far as bromide of silver is concerned; and I have some hope that they may help to explain what the action of light in forming the invisible image and the developing action really are. Should this be the case, the time and labour expended on the investigation of the subject will not have been wasted. The fact that a certain amount of soluble salt is required with bromide of silver, will explain many curious differences of opinion and practice among dry photographers. The conversion of bromide is so slow (this fact was, I believe, first published by Mr. Sutton) that a large amount commonly remains in the film; for this reason some have found that alkalies, hot developers, &c. were necessary to sensitiveness, whilst others, who by different treatment removed the soluble salt to a greater extent, found that such applications produced nothing but fog. Again, bicarbonate of soda used in the developer requires much more soluble salt than ammonia; therefore some have preferred one alkali, some the other. In my hands the soda has proved less manageable. Whether bromide of silver in wet collodion requires the presence of unaltered bromide is a question which I have not investigated; but it is, I believe, a matter of common observation that wet films containing bromide give a flat and foggy image when kept too long in the exciting bath; it would therefore seem, even in this case, unlikely as it appears, that the same law holds good. Some persons may probably object to keeping a limited quantity of salt in the film, as difficult; the only answer to this is, that in the present state of our knowledge I believe that sensitive dry plates cannot be produced by any process without, knowingly or otherwise, complying with this condition, and that ignorance of it has been the greatest cause of uncertainty in dry photography.

One great difficulty, which appears more or less in all processes on glass, troubled me for a long time—that of a halo surrounding the high lights, and which has been called "blurring"; this fault makes the rendering of subjects containing great contrast a matter of much difficulty, and has been one of the greatest banes of photography, not only by its direct effects, but indirectly by driving photographers into the wretched system of taking views with the sun straight behind the camera, and by compelling them to give insufficient exposures with subjects containing violent contrast of light and shade. I had found means of avoiding the evil in question to a great extent, but did not know how these acted, nor whether the mischief was caused optically or chemically, until a statement of Mr. Sutton's explained the real cause, which is light which has passed through the over-exposed parts of the film being reflected forward in a greatly diffused state. After verifying the truth of this theory beyond all possibility of doubt, I was surprised to find that Mr. Marlow had explained the matter in an able paper read at a Meeting of this Society in April 1861. The unreasonable opposition and incredulity with which Mr. Marlow's statement was received, in spite of the plainest proofs, are difficult to understand, and unfortunately deprived photographers of the knowledge of an important fact for some years.

Differently prepared films vary much in their power of stopping light. Tannin dried on the film, gum, gelatine, and similar substances facilitate the transmission of light; but a course of experiments showed that films to which tannin had been applied and washed off again, stopped light as well as or better than any others, wet or dry, except Fothergill plates, which had a slight advantage in this respect; the dense films which, contrary to common notions on the subject, can be produced with bromide, tend also to prevent the evil. The liability to blurring depends a good deal on the depth to which the image is developed; for a superficial image is not affected by reflected light until it has passed a second time through the film. Now a superficial image is usually poor and feeble, and it is impossible to produce a film of collodion, consistently with other necessary conditions, opaque enough to stop all light under some circumstances; it is therefore desirable to take measures to absorb any light which may pass through. Yellow glass does this very effectively, but involves the necessity of transferring the film. Velvet or dry paper of a non-actinic colour pressed against the back of the plate, will absorb the light which passes through the glass, and so prevent what is called fogging from over-exposure, but will not prevent the more local effect of "blurring," which is caused by internal reflection from the back of the glass. To prevent this, the easiest way, with dry plates, is to paint the back with yellow water-colour mixed with gum or dextrine and a little glycerine or treacle, to prevent its drying too much, and so keep it in optical contact with the glass. The painting does not give much trouble, and involves no risk of failure; and it so greatly increases the capability of rendering contrast, that it would be well worth the trouble were this ten times as great.

This paper has already extended to so great a length that I cannot, without being unreasonably tedious, give full practical details, but will mention a few of the principal points which have not already been explained. Gelatine should not be used under a porous bromized collodion, nor with a very acid bath. No substratum is necessary; but a thin coat of india-rubber is easily applied, and on the whole saves trouble by enabling the film to bear rough handling, and to a certain extent conceals slight impurities on the glass. Any tolerably good collodion will answer with a proper proportion of bromide; this should vary with the nature of the cotton; the weight of salt should not be less than twice, nor more than five times that of the cotton. The collodion should set well and firmly; to make it do so, it may require to be salted with bromide of cadmium exclusively; or to prevent its setting too quickly to flow well, it may be necessary to substitute as much bromide of ammonium as will dissolve, for a portion of the bromide of cadmium. It makes little difference what bromide is used, except as regards its effect on the physical state of the collodion. The exciting bath should not be weaker than 60 grains to the ounce; it may be much stronger. By a simple and easy method, all the nitrate not actually used in converting the bromide, may be saved and restored to the bath; this should be freely acidified with nitric acid, which facilitates the conversion, and does not diminish sensitiveness after a good washing in common water which contains a trace of a carbonate; the acid has no effect, after complete removal, in keeping the image bright. The only part of the process in which distilled water is necessary, is for the first washing-waters after the exciting bath. The best form of ammonia for the development is the common sesquicarbonate; 1 grain to the ounce is the best strength in a general way to begin with; the mixed developer may be strengthened if necessary by adding drop by drop a 32-grain solution. Three grains of bromide of potassium in 1 ounce of the 32-grain ammonia solution makes a very good intensifier, and may be used, when much diluted, instead of the plain ammonia solution, to begin the development when the plates have been too much washed, or when they are in the proper condition, after a longer exposure; this is a good plan in cases where great vigour and brightness are more important than sensitiveness. If the collodion contain a large enough proportion of bromide, it will bear almost any strength of ammonia without being loosened. From not knowing all the conditions, I formerly made a mistake in recommending the ammonia to be poured on the film alone before mixing it with the pyrogallic acid; this treatment makes necessary a longer exposure than if the developer is mixed before being applied, even when the tannin has been dried on and acts as a feeble developer with the ammonia. Ammonia alone has a tendency to diminish the impression of light, and makes the image, when brought out by the mixture, very bright, but comparatively under-exposed. It is a curious fact that bicarbonate of soda, applied alone at first, has, on the contrary, a very powerful effect in causing fog with the mixed developer.

All false theories tend to impede progress; and it is to be hoped that the great sensitiveness of films prepared as just described will dispel the illusion that the presence of nitrate of silver is necessary to sensitiveness. This theory is so entirely contradicted by facts, that it has required the support of another equally unfounded notion, which seems to have been specially contrived for the purpose—that is, that it is impossible or difficult to remove all the nitrate of silver from a collodion film. Now, not only will the salts in common water soon decompose every trace of the nitrate, but under all ordinary circumstances, in films containing bromide, a large proportion of this escapes conversion, and must in great part be removed by washing before the full sensitiveness can be obtained. It is evident that the washing out of soluble bromide from the back, through the surface of the film, renders the presence of any trace of nitrate of silver utterly impossible. The time required for the removal of the nitratei n this way, of course depends on the depth to which it has penetrated and the nature of the film; but, to make sure, it is always best to dip the plates in a solution of bromide when the nitrate has been nearly all washed out with distilled water. The strength of the bromide solution is not of much consequence, for the salt introduced in this way is easily washed out again. Soluble iodide is a very powerful agent, and must be used with caution; in a wash with or without albumen, before drying the film, or in the developer, from $\frac{1}{100}$ grain to $\frac{1}{500}$ grain to the ounce may be about the right strength.

At the close of the paper, Major Russell exhibited some specimens. He said there seemed to be an opinion with many persons that bromide films must be transparent. Those which he now produced would show that they were opaque. The negatives on the table were merely trial plates; they differed in the modes of working, and were exhibited to give an idea of their general character, and the kind of image produced by bromine alone. There were some varnished ones, which only showed one thing; if looked at in a proper light a difference of level would be perceived. This was generally caused by piling up; but here it was occasioned by the silver being abstracted from some parts of the film. He also showed some tannin pictures taken in about a quarter of a second, and in which no nitrate of silver was used at all.

Mr. Hughes said he could bear testimony to that world of ingenuity and patience which for years past Major Russell had given to this subject. The results now given were very interesting, because so few persons really worked the process to the extent which Major Russell did. If it were possible so to modify the bromide process as to adopt it in the wet condition instead of the dry, he thought they would soon have a large accession of other experience to aid their own, because there were many persons who were desirous of seeing results quickly. The difficulty interposed with dry plates was that it required patience to attain results. There seemed to be no reason, theoretically, why, if iodide of silver could be useful in this particular form, it should not be otherwise employed, because there was nothing in the hygrometric condition of the material to account for failure in result. He had no doubt, after perusing the paper first laid before the Society, many gentlemen would take the subject up, and prepare special collodion baths for the purpose.

Mr. W. W. King asked whether Major Russell had tried any iron developing solution in the process. He also sought information as to the keeping-quality of the plates. As far as dry-plate photographs were concerned, every effort ought to be directed to the keeping-qualities of the plates after development. It would be a great advantage if by this process they could be kept for a fortnight or three weeks. He had tried some transparencies, and kept them longer than that.

Major Russell said he had tried a few experiments with iron developers, and they answered to a certain extent. He had no doubt they might be made to answer very well; but as tannin and sulphate of iron mixed together made ink, it did not appear to him a suitable way of working, and he did not see any particular promise of advantage in developing by that mode. Respecting the keeping-qualities of the plates after exposure, he could not give any precise information. His own impression was, that they lost little, if anything; but he had only tried one experiment. In that case the plate was kept in a dark room for a month. It was then developed very much in the same way as others, which, taken at the same time, were developed at once. The picture came out in every respect as good, except that it appeared as though a little less exposed. There was no difficulty at all in keeping them for a few days. He had not turned his attention to the wet process.

The Chairman, in proposing that the thanks of the Society be presented to Major Russell, said that that gentleman had indefatigably devoted his time for four or five years to this process, and every month of that time he seemed to have made some further advance. He therefore hoped to see even better results in the future than were now presented, excellent and wonderful as they were. The paper which Major Russell had just read was very lengthy, and entered so much into matters of detail, that it was almost impossible to grasp the whole subject at once. But considering how persevering that gentleman had been, and how kindly he had from time to time placed at the disposal of the Society the results of his experience, he was sure the Members would be gratified in tendering to him the expression of their thanks on this occasion.

The resolution was unanimously adopted, and Major Russell briefly acknowledged the vote.

Mr. Ross exhibited a number of pictures taken by his doublet lens, and the Chairman read the following letter from that gentleman:—

2 Featherstone Buildings, Holborn,
May 9, 1865.

Dear Sir,—I have the pleasure to send you herewith a number of proofs from negatives taken with my new doublet. The larger were taken with a lens of eleven inches equivalent focus, and the smaller with a lens of nine inches equivalent focus. You will oblige me by exhibiting these prints to the Members of the Society.

What I would particularly call attention to is the *absence from flare*, freedom from any distortion or curvature of the marginal lines, large extent of angle, and unsurpassed brilliancy. The pictures have been purposely taken with a very small stop, to test the lenses for *flare*. It is gratifying to find that, although the stop employed was only $\frac{1}{50}$th of the equivalent focal length of the lens, yet, under these difficult circumstances, the defect above alluded to, and which is peculiar in the working of many compound lenses, is not to be found in the operation of this doublet combination.

Time does not permit me at present to prepare a paper on the action of these lenses; but I shall be glad, in compliance with your request, to prepare for you a paper on the subject of Lenses in general, which I hope to have ready during the present session.

Yours very truly,
Thomas Ross.

*To the Chairman,
London Photographic Society.*

Some specimens of photographs done with

Harrison's globe lens, by Mr. J. Sache, of Nassau, were exhibited by Mr. How, showing the absence of "flare."

Mr. **Hughes** exhibited some beautiful photographs of the vessels composing the Channel Fleet.

The thanks of the Society were voted to Mr. Ross, Mr. How, and Mr. Hughes.

The **Chairman** announced that at the Meeting in June a paper would be read by Mr. Pettit on "Binographs."

The proceedings were then adjourned to the second Tuesday in June.

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Report of the Exhibition Committee.

The Committee appointed by the Council of the Society to award the Medals to those pictures in their Exhibition they thought worthy of receiving that honour, and to superintend the arrangements of the Exhibition, beg to make the following report:—

Your Committee have pleasure in congratulating the Council on the numerous and beautiful pictures which form their Exhibition, and which are equal to, and in some instances excel, those of any former year, notwithstanding the numerous Photographic Exhibitions open in Dublin, Berlin, and elsewhere, and which must have absorbed a large number of the best productions of the year. Although the available space has been somewhat limited, sufficient room has been afforded to enable them to do justice to the many fine works sent for exhibition in every branch of the art. Your Committee regret that one of the most important applications of the art, that of reproduction, is not adequately represented, and they also remark that portraiture, in its conventional and routine aspect, forms a less prominent feature in this Exhibition than in those of former years. Coloured miniatures are not numerous, but some very excellent specimens are exhibited; one by Madame Brunner, a member of the Society, may be especially mentioned as worthy of attention.

Landscape-photography has taken the lead in quantity; and there are so many landscape photographs of such great excellence, that your Committee have felt bound to award no less than five Medals to that department alone. Each of the exhibitors in this department produce pictures so essentially different from each other that they must not be considered as to their relative excellence. Prominently must be mentioned the wonderful series contributed by Mr. Bedford, whose marvellously beautiful transcripts of English and Eastern scenery have been the admiration of all photographers, as well as the public, for many years; while those by Mr. England, although of a smaller size, deserve no less praise, his series of views in Switzerland far surpassing anything that has ever been done before in that country. Your Committee have therefore awarded to each of these gentlemen a Medal. Two gentlemen, Mr. Buxton and Mr. Macfarlane, exhibit views taken by themselves in India. These pictures are so different from any which have been produced in that country, and exhibited as specimens of photography in India, being free from the chalky high lights and black shadows hitherto regarded as inseparable from the results obtained in tropical climates, that the Committee felt it would be injustice to give a Medal to one without making a similar award to the other; each of these gentlemen, therefore, has been awarded a Medal. To Mr. Mudd, as the ablest exponent of dry-plate photography in the Exhibition, the Committee have awarded a Medal. This gentleman has worked out the process of M. Taupenot with a commendable degree of pains and assiduity, and has obtained results commensurate with the excellence of the process and the care and skill brought to bear upon the method to which he has devoted himself, his large pictures especially having an amount of force, free from much of the hardness which has usually characterized the pictures obtained by dry plates, which is worthy of attention.

To Mr. H. P. Robinson your Committee have also awarded a Medal. The artistic excellence and unrivalled beauty of Mr. Robinson's portraits and compositions claimed their undivided admiration, and occasioned them no trouble in arriving at a decision. Some difficulty might have been experienced, however, if they had been called upon to decide to which of Mr. Robinson's productions the highest merit belonged; his portrait studies possess a beauty of an unconventional kind, rarely attained in photography, while his pictorial compositions stand unapproached in their kind. Particularly they would call attention to his "Lady of Shalott," a picture which, whilst it has appeared in other Exhibitions, has not before appeared in one of those of this Society. It is an attempt to illustrate in photography Tennyson's well-known poem, with the poetic thought and quaint originality of the pre-Raphælites, and is a curious illustration of the plastic power of an art asserted by some to be purely mechanical.

The series of microphotographs taken by Dr. Maddox, and exhibited by Mr. How, are so superior to anything of the kind hitherto produced, and so free from the defects which have hitherto characterized the enlargements of microscopic objects, that your Committee were unanimous in awarding them a Medal; they seem indeed to inaugurate a new era in the scientific applications of photography, and, whether regarded as triumphs over mechanical difficulties or results of the highest educational and scientific interest, are alike of the greatest value and importance.

It will be seen that your Committee have awarded seven Medals; but five of these having been, in their estimation, almost imperatively demanded by the excellence of the landscape-photographs exhibited, your Committee hope that the Council will have no difficulty in exceeding by one the six originally placed at their disposal.

Your Committee are glad to report that the Exhibition contains some important illustrations of new processes, and fresh applications of the art. Foremost amongst these is the new process of printing by Mr. Wharton Simpson, by means of a new preparation which he has named collodio-chloride of silver, a detailed description of which was read at a recent Meeting of the Society. Some highly praiseworthy specimens of this process, both on paper and opal-glass, are here exhibited; and from the excellence of the specimens already obtained, and from the extended applications which they understand Mr. Simpson has in progress, your Committee have no hesitation in suggesting to the Council the award of the President's Medal* as a suitable recognition of the value of this process, and the liberal manner in which it was given to photographers through your Society, unfettered by patent restrictions.

Mr. Swan exhibits specimens of his carbon process of a larger size than his former ones; but it is with some regret the Committee observe that the beauty of his earlier productions has not been maintained, and it would lead them to hope that this may be the result of the want of pleasing negatives rather than any radical defect in the process.

The wonderful advance made by Major Russell in dry-plate photography will be brought before the Society at their next Meeting; the specimens here exhibited surpass in excellence all specimens hitherto shown, but had not arrived in time to be considered by the whole Committee together.

The productions of Mr. Pouncy have excited much discussion of late. Your Committee are happily relieved from the necessity of a lengthened comment thereon: they simply invite the attention of photographers to the examples hung in the Exhibition, from which they can form their own estimate of how much has been achieved, and how much yet remains to be done.

Some fine examples of the photographic enamels of M. Lafon de Camarsac are exhibited by Messrs. Marion & Co. The beauty and interest of these specimens are sufficient to cause your Committee to regret that the details of their production are preserved secret, and therefore precluded from that consideration from the Photographic Society which they would otherwise have obtained.

The burnt-in photographs of M. Joubert are by a modification of his patent process, and, for the reason just alleged in regard to M. Camarsac, preclude extended consideration. They are, however, very beautiful.

Mr. Griggs has a frame of specimens of photographic block-printing, the details of which, your Committee express a hope, will be made public at a Meeting of the Society.

A frame of pictures, produced by the aid of the magnesium light, is contributed by a Member, Mr. A. Brothers of Manchester.

Mr. J. E. Palmer exhibits specimens of an interesting application of photography, in the shape of enlargements by the solar camera on canvas ready for the hands of the painter.

Mr. Russell Manners Gordon exhibits some examples of landscape-photography in cabinet size, embracing a very large angle, and having rare delicacy and atmospheric effects. Mr. Annan, of Glasgow, has also some very fine landscapes. Mr. Rimington has some fine cabinet pictures of clouds and instantaneous views. Mr. Valentine Blanchard exhibits a series of instantaneous stereographs, chiefly marine subjects, possessing combination of water, shipping, and moving figures, with some unusually fine effects of clouds.

Of the limited number of portraits exhibited, those of Messrs. Claudet and Jeffery merit attention.

The combination-photograph, "Our Society," by Mr. Twyman, representing a musical society in practice, although not a complete success, is full of promise, and leads your Committee to expect some more valuable contributions from this gentleman to our Exhibitions of future years.

Admiring the enthusiasm of Mrs. Cameron, the Committee much regret that they cannot concur in the lavish praise which has been bestowed on her productions by the non-photographic press, feeling convinced that she will herself adopt an entirely different mode of representing her poetic ideas when she has made herself acquainted with the capabilities of the art,—no sacrifice of pictorial beauty being demanded by nice attention to skilful manipulation and care in the selection of properly adjusted optical instruments.

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* At a Meeting of the Council held in 1863, it was resolved that a Medal should be struck, to be called the "President's Medal," having on the obverse the likeness of the President, the Medal to be given at any time to those whom the President and Council shall deem worthy of reward for any remarkable discovery, improvement, or application of the photographic art, or other meritorious object connected therewith.

Card-portraiture is well represented. A degree of uniform excellence has been generally obtained in this direction.

It may not be out of place for your Committee to suggest to exhibitors greater care in assimilating their pictures together, to avoid incongruity.

Signed on behalf of the Committee.

James Glaisher, *Vice-President.*
Hugh W. Diamond, *Secretary.*

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

Annual General Meeting,

held in

The Society's Hall, 117 George Street,

May 9, 1865.

Colonel **Bell** in the Chair.

The Minutes of the preceding Meeting were read and approved.

Sir **David Brewster** exhibited to the Society a photograph of Warwick Castle, taken several years ago by the late Mr. Buckle, of Leamington, in which the picture of the Castle seen by direct light has, in several parts, disappeared, while the same parts of the picture seen by reflexion from water are as distinct as they ever were. In a few years therefore, when the direct picture of the Castle has disappeared, the picture of it as reflected from the still water will be perfectly distinct.

Mr. W. D. **Clark** suggested, as a probable explanation of the phenomena, that, as well known to all artists, shadows in water were always darker than the substance they represented, consequently this was the case in all photographs, and presuming that the view of Warwick Castle had all faded equally, the result would be that the Castle being originally more delicate than the shadow, would show greater symptoms of decay.

The **Secretary** then read the following communication:—

A few Remarks on Triplets, Doublets, and Single View Lenses, with reference to Marginal Distortion. By Thomas Ross, Esq.

The subject of the removal of distortion from photographic lenses received some years ago very serious attention, in consequence of the Report of a Committee appointed by your Society to ascertain the capabilities of then-existing lenses in producing images free from that particular kind of distortion known as *curvatures of marginal straight lines.* There are other kinds of distortion which need not be noticed in this paper; but the worst kind of distortion, before which every other sinks into insignificance, is that by which the form of a perfectly square object is imperfectly rendered in the photograph. The Report alluded to called attention to some facts which were previously well known to all who are at all conversant with the subject,—viz., that when the picture of a square object is taken with an ordinary landscape objective, in which the stop is placed in front of the lens, the lines towards the margin of the picture are curved *outwards*; and that when, as in the orthographic lens, the stop is placed behind the anterior combination, distortion of an opposite character is the result, the lines then being curved *inwards.* A triplet lens, made by the late Mr. Goddard on the principles enunciated by Mr. Sutton, being then the only lens known to be free from this imperfection, opticians turned their attention towards the improvement of this lens, which, with slight modifications, has now taken its place among the recognized requirements of photography. The Photographic Society of Scotland, by stimulating a demand for lenses which would give freedom from distortion, has thereby rendered efficient service to the cause of photography.

The subject of distortion has engaged much of the attention of opticians, and the most strenuous efforts have been made by them to eliminate every trace of this defect without at the same time sacrificing the other necessary qualities which every good lens should possess.

In the remarks which I shall make, I purpose substituting for the expressions "*barrel-shaped*" and "*pincushion,*" or "*sand-glass-shaped*" distortion, the more correct terms "*convex*" and "*concave*" distortion.

In introducing to your notice a new lens which I have constructed to supersede other existing lenses, it is necessary that I should indicate the points of difference which exist between them. I shall first notice its peculiarities. It includes an angle so great in extent as to go far beyond all that has been previously accomplished, and even exceeds artistic requirements, the range of subject being double of that included by ordinary view-lenses. It produces pictures absolutely free from either convex or concave distortion. It does not give even the faintest trace of the flare which often characterizes pictures produced by certain other compound lenses. Lastly, the oblique pencils being carefully corrected, it produces pictures exquisitely sharp at the extreme edge as well as at the centre of the field. Allow me to dwell briefly on each of these particulars; and if in doing so I should be considered as expressing myself somewhat dogmatically in favour of my new lens when contrasting it with others, you will do me the justice to remember that I have not sought to secure it by patent, or in any way to restrict its manufacture, but have freely published the details of its construction for the benefit of all who choose to avail themselves of them.

The angle of view embraced on a flat plate by my doublet is greater than that of any other lens which I have ever either seen or heard of. Artists have fixed what I may call the normal angle of a picture at 60 degrees, the diagonal of which would consequently be about 70 degrees; the angle of view included by a portrait lens, furnished with a small stop, is about 56 degrees on the diagonal; that given by an average single achromatic view-lens is about 46 degrees; that by a triplet, 50 degrees; while that by my ordinary doublet is 70 degrees, and by my large-angle doublet upwards of 90 degrees: these angles are included on the plates which the doublets are advertised to cover; but the ordinary doublet may be made to include a greater angle; for instance, that of 9 inches focus, intended for 10 × 8 plates, can be made to cover a plate 12 × 10. This great increase of angle is an immense advantage, although the photographer may not be desirous of making use of it on all occasions.

But there are subjects which cannot be properly taken without such a lens. For instance, it may be of importance to photograph a building, from which a wall or some other obstacle prevents the photographer from being able to place his camera at a sufficient distance to include the whole of the building; or in taking a landscape, it may be necessary for special pictorial effect that certain subjects be introduced which, by lenses of ordinary angle, could not be included; and this, doubtless, was vividly impressed on the mind of the President of the Royal Scottish Academy when he stated that "photographs were only bits of pictures." An increased width of angle may be obtained with an ordinary meniscus view-lens when the stop is placed closer to the lens than when in its best position; but the advantage thus obtained is at the expense of flatness of field, while at the same time the aberration of the oblique pencil rapidly increases. The former defect, viz. roundness of field, may practically be removed by the employment of a very small stop, which at the same time will also tend to correct the aberration of the oblique pencil. The latest-constructed lens of this kind (one for which a patent has been obtained, and in the production of which we are told that "*the distortion has been reduced to a minimum*") gave convex distortion to such an extent when tried on a plate 10 inches square by Mr. Sutton, that, according to that gentleman, the image of a window-frame, to which the camera was pointed, was bent inwards at its extremities like a barrel; and by measurement he ascertained "*that when this curved line touched the edge of the ground glass in the middle, the extremities were each $\frac{3}{4}$ths of an inch distant from it.*" This is not cited with a view to make invidious comparisons between my doublet (which gives *no* distortion) and the patented production of any other maker, but rather to show that no single cemented lens whatever, no matter how or by what number of elementary pieces it may be corrected, can give pictures of a wide angle without the attendance of excessive convex distortion.

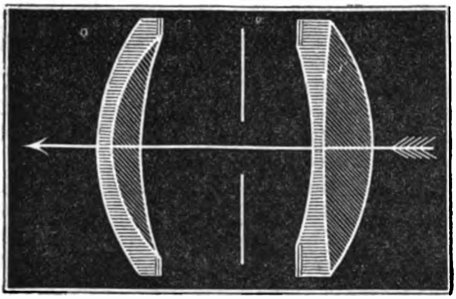
The next peculiarity of the doublet before you is that it produces pictures free from flare. Those who work with single achromatic lenses of good construction are not likely to be practically acquainted with this defect, which, under certain conditions, is peculiar to ordinary compound lenses. In the doublet every source of flare or false light has been removed, and the pictures produced by it possess all that exquisite cleanness and vigour which characterize the best productions of the ordinary view-lens.

A fourth peculiarity of the doublet is, that the image is intensely sharp over the whole of the field. This property may easily be obtained by a single achromatic meniscus lens of proper construction; but, as I have previously stated, marginal distortion to a considerable extent must necessarily exist. If the stop be pushed up close to the lens, the distortion is lessened, but the flatness of field destroyed; if the stop be removed to the necessary distance from the lens to restore flatness of field, then is the distortion increased. The advantage derived from the ability to increase or decrease the distance of the stop from the lens, has been duly appreciated by Mr. Grubb, who, in most of his aplanatic view-lenses, has an ingeniously constructed mount by which the operator has a considerable range in fixing the position of the stop. A landscape-lens, to give a flat field, should be externally of a meniscus form; and the wider the angle to be included, the deeper should the curves of the meniscus be. It so happens that some time ago Mr. Sutton calculated the curves of what he considered the best form of single achromatic combination; and curiously enough, the front lens of my doublet is very similar in its construction to the "Sutton meniscus," although my calculations were perfectly independent of Mr. Sutton's.

Hence, should any circumstance arise which renders it desirable to employ a single instead of the double lens, the front lens of my doublet supplies the most perfect single view-lens which can be constructed; for the field is flat, the angle of view is large, and the definition superb. But in this altered form, as I have already stated, it will not answer properly for architectural subjects, on account of its tendency to curve the marginal lines. It possesses this tendency in common with every single view-lens, whether patented or not, although, from the peculiarity of its construction, it gives much less distortion than any other. It is only in its completed form, or when *both* lenses are *in situ*, that absolute freedom from distortion is secured.

Having now briefly stated the peculiarities belonging to the doublet, allow me in conclusion to state that this lens has been made in consequence of repeated demands by our leading photographers, to produce for them a lens which should give pictures of very wide angle, brilliancy of detail, freedom from distortion, and be withal of a moderate size: these conditions I consider to be fulfilled in the doublet now before you.

Having stated what the doublet lens *does*, I shall now briefly conclude by giving a short description of what it *is*. In external form it bears a close resemblance to the globe lens of the late lamented Mr. Harrison, of New York; but its essential construction is very dissimilar, its corrections being differently effected, as may be seen in the annexed diagram.



Both combinations are of the deep meniscus form, but are differently achromatized. The general optical arrangement is such that, while this instrument yields nothing in brilliancy of definition to the best single view-lens, a remarkably large angle, a very flat field, and straight marginal lines are the admitted characteristics of my doublet. I confidently submit that, as a *view*-lens, it is better than any other; as an *architectural* lens, it is unsurpassed; as a *copying* lens, it has no rival.

The accompanying prints are submitted to the examination of the Members of your Society in illustration of the capabilities of my doublet.

Mr. James G. Tunny proposed that a vote of thanks be awarded to Mr. Ross for his very important communication, and also for his kindness in forwarding for exhibition such a beautiful collection of very perfect views taken by the new doublet.

The Secretary then read the following Report by the Council:—

The Council, in accordance with the Laws of the Society, have now, at the conclusion of the Ninth Year of its existence, to present their Annual Report to this Meeting.

The Council are glad to have it in their power to report the continued efficiency and prosperity of the Society, although they have still to regret the want of additional Members, and would again urge upon every one in the Society the desirability of doing their utmost to add to their numbers, as the best means of increasing its usefulness and strength.

The following Papers have been read during the Session:—

On a New Method of Photographic Printing; by Mr. Thomas Fox, Alloa.

Printing in Carbon, illustrated; by Mr. John Pouncy, Dorchester.

On the Application of the Camera and Lantern to the Illustration of Popular Science; by Professor Archer.

New Collodion Printing Process, applicable to Vitreous, Enamelled, and other surfaces; by Mr. James G. Tunny.

On the Glass Room and Portrait Camera; by Thomas Sutton, B.A., Jersey.

On the Temperature of the Bath and Developing Solution, as affecting Photographic Operations; by Mr. Thomas Rodger, St. Andrews.

On the Wöthlytype Process; by Mr. J. T. Taylor, London.

It will be seen from the above list that the importance and interest of the communications read to the Society have in no way fallen off.

At the request of many Members of the Society, the Council were induced once more to make arrangements for a General Exhibition, although with the knowledge that no better room could be had than the one which was previously found to be so unsatisfactory as regards situation.

The Exhibition was accordingly open from 20th December to 18th February; and the Council are glad to report that, Photographically, no previous Exhibition has been such a success, whether as regards the beauty or the variety of the works exhibited.

The Committee appointed by the Council

selected the following pictures, for which they recommended that the Silver Medals of the Society should be awarded:—

To Mr. H. P. Robinson (London) the medal for portraiture, for his Picture of "Brenda"; Mr. James Mudd (Manchester) the medal for landscape, for his View of "Dunham Park"; Mr. Thomas Annan (Glasgow) the medal for the best View in Scotland, for his "Dumbarton Castle"; Mr. John Smith (Darnwick Tower) the medal for the best view by an amateur, for his Picture "On the Leader near Melrose"; Mr. J. Ramsay L'Amy (Dunkenny) the medal for the best group; Mr. Samuel Highley (London) an extra medal, for a series of Microscopic Objects enlarged for the magic lantern; the Pantascopic Company (London) an extra medal, for Panoramic Views taken with the pantascopic camera.

The Council are glad to say that, to judge from the letters of acknowledgment returned by those who received them, the Medals of this Society are held in the highest possible esteem,—a proof that the various Prize Committees have successfully striven, through a series of years, in their difficult and arduous task, to give honest and conscientious awards.

The Council have to regret, however, that this Exhibition, like its last predecessors, has proved a failure financially, the loss to the Society being £48 13*s.* 9*d.* This has been the fate, more or less, of every recent Photographic Exhibition, and is the more to be regretted, as it is the opinion of some of the best Photographers in the country, and others qualified to judge, that the future progress of this beautiful art depends more on public exhibitions for its advancement than on anything else.

The Council have this year selected for distribution to the Society the prize portrait by Mr. H. P. Robinson, entitled "Brenda." This fine specimen of portraiture is now being printed, and will shortly be distributed to the Members.

In order to facilitate the prompt publication of the reports of the meetings in the "Photographic Journal," the Council would recommend that the Monthly Meetings of this Society be held next Session on the *first* Tuesday of the month, in place of the second, as at present, which would allow ample time for the report to appear in the first publication after each meeting, which is frequently impossible under the present arrangement.

Keeping in view the loss sustained by this year's Exhibition, the Council would recommend that the Council now to be elected consider, during the summer, whether there should be a General Exhibition, or not, next session; but that the Society offer the following Medals for competition:—

For the Best View taken by a dry process; the details of the process to be communicated to the Society.

For the Best View, taken by an Amateur, by any process.

For the Best Portrait.

For the Best Enlargement (View of Architectural Subject).

For the Best Enlargement of a Portrait.

Enlargements must be, superficially, at least four times the size of the original picture.

The Council to have the power of awarding extra Medals for any picture of sufficient merit which may not have been included in the above list.

All the pictures must be untouched, and from single negatives, except in the case of Views, which may have the sky printed from another negative, or they may be toned or shaded before fixing.

As required by the Laws of the Society, the President, the Senior Vice-President (Mr. Horatio Ross), the four Senior Members of Council (Messrs. A. Y. Herries, J. Ramsay L'Amy, Thomas Bell, and William Walker), the Honorary Secretary, and the Honorary Treasurer retire on this occasion, but are re-eligible.

The Honorary Secretary, however, has intimated a desire to retire from office.

The Council would suggest that the President be re-elected; that Mr. George Moir be elected Vice-President, in room of Mr. Horatio Ross; that the Treasurer and Auditor be re-elected; that Colonel Bell be elected Secretary, and that Messrs. Horatio Ross, Archibald Broun, T. B. Johnston, and W. D. Clark be added to the Council, in room of Messrs. J. Ramsay L'Amy, William Walker, George Moir, and Colonel Bell.

Abstract of the Honorary Treasurer's Account.

From the Account of the Honorary Treasurer, which, with the Docquet of the Honorary Auditor, certifying its accuracy, was laid before the Meeting, it appears that

The sum of the Charge is	£433	16	0
The Discharge is	170	12	10½
Balance in favour of the Society	£263	3	1½

List of Office-bearers, 1865–66.

Patron.—His Royal Highness the Prince of Wales.

President.—Sir David Brewster, K.H., F.R.S., &c. &c.

Vice-Presidents.—Rev. D. T. K. Drummond; George Moir.

Council.—Horatio Ross; James G. Tunny;

Wm. Scott Elliot; C. G. H. Kinnear; T. B. Johnston; Archibald Broun; W. D. Clark; A. Y. Herries.

Honorary Treasurer.—H. G. Watson.

Honorary Secretary.—Colonel Thomas Bell.

Honorary Auditor.—John Cay.

On the motion of the **Chairman**, seconded by Mr. C. G. H. **Kinnear**, the Report was approved of.

Mr. G. M. **Tytler** said that he rose to propose a vote of thanks to their late Secretary, Mr. Johnston, for the very efficient manner in which he had discharged the duties of his office: he was sure they would all agree with him in saying that the Society is greatly indebted to that gentleman for its present prosperity and efficiency.

Mr. **Johnston** in reply said, Mr. Chairman and Gentlemen, I beg to return you my sincere thinks for the compliment you have paid me. On leaving office I would desire to say that nothing but want of leisure would have induced me to relinquish it, so long as the Society would have been pleased to retain my services; and I shall ever look back with pleasure to the intercourse I have had with many kind friends and correspondents as Honorary Secretary of the Photographic Society of Scotland.

The **Chairman** said that only one duty more remained to conclude the business of the Session, which was to propose a vote of thanks, which he had much pleasure in doing, to the Honorary Treasurer and the Honorary Auditor. You all know how much the Society is indebted to those gentlemen for the trouble they take in managing the financial department of the Society.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary Monthly Meeting of this Association was held at Myddelton Hall, Islington, on Wednesday, May 3, Mr. Hislop, F.R.A.S., in the Chair.

The Hon. Secretary (Mr. Barnett) read the Minutes of the last Meeting.

The **Chairman** stated that notice had been given that this Meeting would be made special for the purpose of making a slight alteration in the Rules of the Association with respect to the period of opening and closing the Session.

Mr. W. **Warwick King** moved a formal resolution altering Rule 6, the effect of which is that the Sessions will in future commence in October and close in June, instead of commencing in September and closing in May, as heretofore.

Mr. **Bockett** seconded the resolution, which was put and agreed to *nem. con.*

The **Chairman** said he had the pleasure to announce that at the next Meeting Mr. T. W. Burr would read a paper "On the application of Photography to the continuous self-registration of magnetic and meteorological phenomena as practised at the Royal Observatory, Greenwich."

Mr. W. **Davis**, Jun., Photographic Artist, of Sussex Place, Regent's Park, was elected a Member of the Association.

The **Chairman** called attention to some beautiful photographs of views in the neighbourhood of Nelson, New Zealand, which were exhibited by Mr. Davis. He said he believed they were all by the dry process, and that some were developed by iron.

Mr. **Bockett** inquired what collodion had been employed.

Mr. **Davis** said he had used Ponting's collodion. They were prepared with a 10-grain solution of tannin, washed before the paper was coated, and slightly afterwards, then dried. He had developed with a 60-grain solution of iron, which brought out the image instantly.

Mr. **Simpson** said he supposed the tannin was thoroughly washed away.

Mr. **Davis** replied that he had not taken special pains to do so; he had merely poured about 4 oz. of water over the plates, which were glass stereoscopic plates; some that he washed thoroughly he did not think were so good.

Mr. **Bockett** inquired whether the light in New Zealand was very vivid.

Mr. **Davis** said there was always very clear weather, but he did not think the light was more intense than in England. In reply to further inquiries, he stated that he employed Dallmeyer's No. 1 B portrait lenses, and used the third-sized stage from the smallest.

Mr. W. W. **King** asked as to the keeping-qualities of the plates in New Zealand.

Mr. **Davis** said he prepared them one day and used them two days afterwards.

On the suggestion of the Chairman, the thanks of the Association were voted to Mr. Davis.

Mr. **Springham** exhibited an improved Camera-slide. The slide is pressed upon by a slight strip of ebony, with two or three springs behind it. When the shutter is down, the strip of ebony keys into a bevelled groove, and cuts off the possibility of any light entering, and at the same time all projections on the slide are done away with. In one modification of the invention the slide is pressed between two strips of ebony during the whole of its motions. Mr. Springham also exhibited a large Camera and a Camera-Stand, which allows of a considerable amount of horizontal and vertical motion to the camera, at the same time that it is strongly fixed to the stand by three modes of support.

After some conversation, thanks were voted to Mr. Springham.

Mr. G. W. SIMPSON read the following paper:—

Collodio-chloride of Silver on Opal Glass.

THE method of printing on opal glass by means of collodio-chloride of silver is the most simple in practice, and the most satisfactory in result of any process for the purpose with which I am acquainted. For producing transparencies either on opal or plain glass, or mica, it is equal in result, and simpler in detail than the various processes of producing transparencies by development, whilst for pictures by reflected light it gives vigour, brilliancy, and delicacy not easily otherwise attained. The short notice at which I undertook, at the request of the committee, to bring the subject before this meeting, does not, I regret, permit me to do more than state very briefly the means employed for producing the specimens on the table, without entering into the various modifications of which the process is capable. But the details I shall state are such as have given me uniformly successful results.

The collodio-chloride of silver is prepared, with some slight modifications, very similarly to that I have used for printing on paper. To each ounce of collodion are added—

Nitrate of silver	7½ grains
Chloride of strontium ..	2 „
Citric acid	1 grain.

It will be seen by those who remember my formula for collodio-chloride for printing on paper, that there is a little less free nitrate of silver, and a little more chloride, than I used for paper, and in each ounce of collodion a grain of citric acid. If the collodio-chloride prepared for paper was used on glass, the image was wanting in vigour, and, moreover, the nitrate of silver was apt to crystallize on the surface in drying. Slightly reducing the proportion of nitrate of silver and adding citric acid, produced just the condition for giving satisfactory vigour on glass. The use of citric acid to give vigour was suggested some months ago by a gentleman who prefers to be known as "The Photographer's Assistant." It gives vigour in printing on paper, but appears to retard toning. On glass it produces no such result, toning going on rapidly. Possibly there may be many substances which would produce a similar vigour, but at present this answers satisfactorily.

The collodion contains equal portions of ether and alcohol, the amount of cotton varying with its quality. Of the sample I have been using, six grains give a satisfactory collodion. It is as important here as in printing on paper, that the collodion should be one drying free from all opalescence or opacity before the sensitive salts are added. Some of the specimens on the table are produced by a sample of collodio-chloride prepared by Messrs. Mawson and Swan expressly for printing on glass, and it answers exceedingly well, especially with a vigorous negative.

The various kinds of opal glass give widely different results, some of which are peculiar and interesting. One sample ground perfectly flat, but not polished, having indeed a surface like fine ground glass, and from which I hoped to secure some fine effects, I have not been able to use at all, and have lost several good pictures by trying it. All goes on well until the drying, and then the film invariably splits up into ribbons, although the same collodion on polished glass has shown no such disposition. Very singularly, moreover, it has happened in some cases that a distinct image remained imprinted on the ground opal glass after the collodion had split away.

The glass giving the most satisfactory results is a thickly flashed glass, of pure-white surface, ground and polished. This, whilst leaving something to desire on the score of colour—a warmer or more cream-like tint would be better—answers in all respects perfectly. With the samples of collodion I have used, which are somewhat contractile, an edging of varnish or dilute albumen has been found necessary, to prevent the film leaving the glass in toning, fixing, &c. I have not found any especial pains in cleaning necessary, a hasty rub with a tuft of cotton wool and a little alcohol being the only cleansing employed, and, in many cases, merely rubbing the surface of the glass as it came from the dealer, with a clean cloth, has been found sufficient.

The glass I have mentioned gives an exceedingly delicate and pleasing surface, and a very brilliant-looking picture. The same glass, before it is ground and polished, having a smooth but slightly granular surface, gives for some pictures a very fine effect, having somewhat the appearance presented by a rough drawing-paper very suitable for large heads.

Another sample of glass of an entirely different kind, being a pot-metal, white throughout, instead of flashed, has given some very curious results. It is beautiful in texture, good in colour, and promised exceedingly well; but from some cause, of the exact nature of which I have not yet satisfied myself, it does not yield such brilliant pictures with the same sample of collodion, and from the same negatives, as the flashed glass; and what is not less odd, the prints seem to possess an amount of softness and delicacy of gradation not to be found in other impressions from the same negative. The prints so obtained are admirable as transparencies, but lack force by reflected light, the image appearing to be actually sunken into the glass. At first I thought that this was due to the translucency of the material, which, like ivory, required backing with some white material to give the lights their due vigour; but on trying this, the prints were still found wanting in force. I then thought that the collodion must have become decomposed and gave an opalescent film, which caused the sunken-in effect. But the same collodion on other glass was all right, and a fresh collodion on this glass still gave the same soft sunken-in-looking pictures by reflected light. The cause really appears to be in the translucency of the glass: there is no white reflecting surface to form the lights of the picture—the light passes partially into the glass instead of being reflected from its surface. In some cases this is strikingly illustrated; the black portions of the picture being actually on the surface, reflect light from that plane, whilst the lights being in the glass, as it were, appear beneath the darks, which in some cases, when viewed with a strong light, actually cast a shadow on the lights beneath. The pictures have an exquisitely delicate and diaphanous effect, and are perfect as transparencies, but they lack some degree of force, compared with similar pictures on the flashed glass.

After the plate is coated with collodion, and quite dry—I prefer to finish before the fire, so as to secure perfect safety—it is placed carefully on the negative, and, in my practice, exposed in a common printing-frame. In some cases I have, by a little contrivance, managed to examine them without any displacement; but in most cases I have relied very much upon judgment, or guess. With a negative without any veil or deposit in the deepest shadows, I find it possible to form a very accurate judgment by watching the darkening, and when the deepest shadows appear bronzed I find the whole picture sufficiently done. With negatives having no bare glass, even in the deepest shadows, no indication of progress can be seen, and it is necessary to rely solely on personal judgment, based upon a knowledge of the negative. I find the exposure to be somewhat less than is necessary with paper prints. In some instances I have found an exposure of five minutes in sunshine sufficient, whilst with a very opake negative an hour has been required. I find that it is wiser to over-expose than to under-expose, for two or three reasons. In the first place, a dark picture on opal glass has more transparency and delicacy than a dark print on paper; in the next place, whilst if the impression be too light it is useless, if it be too dark it makes an excellent transparency; and finally, it is possible to reduce an over-printed proof on opal glass with cyanide of potassium quite successfully. Here is a specimen which, having been forgotten, was over-printed to blackness in its highest lights; after toning and fixing, it was still like the portrait of a negro. A strong solution of cyanide of potassium was applied, and in a few seconds it was reduced to a reasonable depth.

When printed sufficiently—and I may here state that I find just about the same amount of over-printing necessary as it is usual to give the albumenized paper—the print is toned by any of the alkaline gold-toning solutions, the only condition necessary being that the solution should be very dilute, and it is better old, as the toning generally goes on very energetically, and it is easy to over-tone.

The fixing is effected with hyposulphite of soda, one ounce in ten of water; five minutes are sufficient for the operation of fixing. A few minutes' thorough washing under a tap are sufficient to remove all the hyposulphite. The tone deepens considerably on drying.

The same process, printing deeply, gives on plain glass or mica very fine transparencies for the magic lantern, or other purposes. It is probable, as Mr. Swan has suggested, that a valuable method of reproducing negatives may be found in this method of printing. Some further reference to this method of printing on other substances must be reserved for another occasion.

The Chairman said the Association were much indebted to Mr. Simpson. He thought there was a great deal to be made out of this discovery, and he hoped the attention of photographers would be specially directed to it.

Mr. Simpson, in reply to a question, said he had made inquiry, and was informed that the opalescence in the glass was the same in both instances; but he doubted the correctness of the statement.

Mr. Gossett said, he was rather surprised at the film floating off the surface. He had often floated collodion on common glass, and could scarcely remove it afterwards.

Mr. W. W. King asked whether some of the specimens exhibited would do for transparencies.

Mr. Simpson said, some of them were intended for transparencies.

Mr. Bockett wished to know whether, in case of actual contact, the chloride of silver would answer if employed in the copying-press.

Mr. Simpson said it would be slower, unless developed; but otherwise it would answer.

A Member asked, with reference to some of the specimens, whether the chemicals had penetrated into the glass, or whether the colouring-matters in the glass had entered into combination with the silver.

Mr. SIMPSON said, he was disposed to believe the latter, inasmuch as it had not been removed by washing. He had had plates of opal glass completely stained after two or three printings, which neither acid nor cyanide would remove. For transparencies, mica had this great advantage; that the transparencies could be printed by superposition, and the process could be watched throughout.

Mr. COLLIS said, there could be no doubt about the staining of the glass in these instances; it stained very easily.

Mr. GOSSETT inquired whether sulphuric acid had been tried for cleaning the plates.

Mr. SIMPSON said, he had tried it.

The CHAIRMAN said, he had been in the habit of using half parts of sulphuric acid for the purpose, and found that it answered admirably.

Mr. COOPER said, he had used citric acid for printing on albumenized paper. He heard that it had been used in this process and gave great vigour. But, upon printing, he was astonished to find the pictures wonderfully soft rather than brilliant; in other respects they were very beautiful. With some negatives, from which he was unable to get any prints, he had by this means succeeded in getting very satisfactory results. He did not know whether any other member of the Association had tried citric acid in the printing-bath. If so, he should be glad to hear the result. He found it toned rather more slowly.

Mr. SIMPSON said, Mr. Cooper's experience was somewhat singular in this respect. In a conversation which he had recently had with Mr. Frank Elliott, that gentleman mentioned the extreme vigour which, in his experience, the use of citrate of silver in the printing-bath gave.

Mr. FOXLEE said, he had tried paper prepared with acetate of silver as well as chloride, and also citric acid, in the printing-bath, but never found any advantage from it. The pictures printed exceedingly red, and toned very slowly indeed.

Mr. SIMPSON had found the same result. There was certainly great vigour; but the print obstinately refused to tone, and it was difficult to get beyond a brown tone by any means.

The CHAIRMAN, in answer to Mr. Cooper, said he had been in the habit of using dilute albumen for some time, always filtering it very carefully. But during the last few months he had adopted a plan which he found much better: it gave less dust, and was altogether more readily employed. He took a small quantity of dilute albumen in a bottle, and flushed it over the glass. Every particle of dust was carried off in that way, and he found that it was much more free from specks than could possibly be secured by the most careful filtering. He had also been in the habit of using it in all cases in which much free development or much intensity was required. He had constantly experienced the loss of a picture from splitting up in drying, and had been anxious to adopt some means which would give a good surface as quickly as possible. By the simple method he had mentioned, he had found that all extra precautions as to filtering were superseded. He inquired of Mr. Simpson whether he had succeeded in facilitating the manufacture of collodio-chloride?

Mr. SIMPSON said, he had not made the attempt.

The CHAIRMAN, in closing the conversation, said he would take the opportunity of stating that in connexion with the proposed Exhibition of Arts and Manufactures for North-eastern London, which was to be held in the Agricultural Hall during the ensuing autumn, it was contemplated that a limited number of Medals should be awarded in the Photographic department. He also stated that the Committee had succeeded in separating the apparatus from the pictures, and that the latter would be exhibited in the Fine Arts Department. The medals would be awarded separately for each. The details were now under the consideration of the Committee, and he hoped that shortly the members of the Association would receive a circular stating the conditions of exhibition. It was very desirable that every effort should be made to obtain good specimens on this occasion, as it was the first opportunity of having an Exhibition under their own supervision, close at hand, and with the advantage of a good light for the pictures.

The proceedings were then adjourned.

How to print Enlarged Positives, without the Sun's direct Rays?

To the Editor of the Photographic Journal.

Niddry Lodge, Kensington, May 4, 1865.

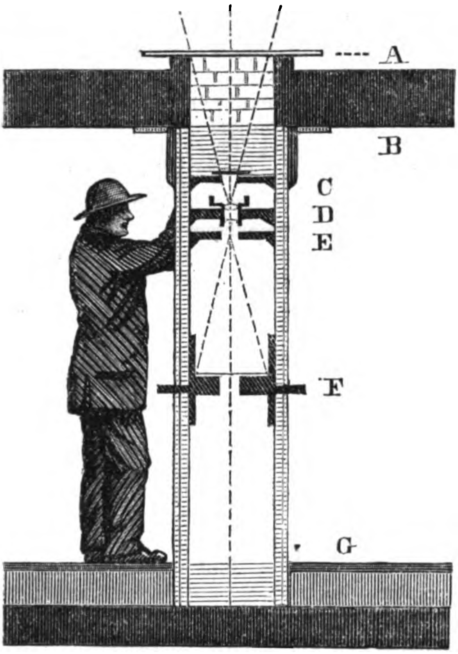
SIR,—As a contributor of sundry papers to the 'Photographic Journal,' I venture to ask if any other contributor will be kind enough to describe a good method of preparing sensitive paper for printing enlarged positives in a camera, without using the sun's direct rays?

A solar camera is costly, and can only be used when the sky is clear. By the method described (vol. v., December 11, 1858, No. 74, p. 100) I can magnify or reduce to any amount, and use any lens, with or without the sun's direct rays. With a quarter-plate portrait-lens and an inch stop, a small negative image on glass, enlarged five diameters, prints on wet collodion, in five seconds, with light from the zenith, passed through ground glass, on a cloudy day. I can thus print large, sharp, transparent positives on glass, and, by repeating the printing, large negatives on glass or on paper. I want to print large paper positives from small glass negatives taken from nature, for reasons given in the paper quoted, and because every extra printing and chemical operation loses some detail, and adds trouble, cost, and risk of failure.

Where collodion films were printed in five seconds, salted paper was exposed for two hours without changing colour; the paper was then placed under a negative and exposed for a few minutes in the ordinary manner, with the usual result. Another paper, tried with a professional photographer, also failed. Amongst your numerous readers, some one may have found, and may be willing to describe, either by letter or in the Journal, a process by which pictures can be taken on paper, in a camera, with some exposure, long or short, in a place of light, where pictures are taken on collodion with an exposure of half a minute, or five seconds, or a shorter time. Of many methods the best yet discovered ought to be known, and the 'Journal of the Photographic Society' is the proper medium for its publication.

J. F. Campbell.

P.S.—I send a sketch of my dark room, fitted for enlarging.



A. A sheet of glass to keep out dust or rain. B. Roof, with a hole in it. C. Box and slide to hold the negative. D. Slide for the lens. E. A board to shut off light. F. Sliding table for the focusing-screen and sensitive surface. G. Floor.

◆

"Photographs in Natural Colours."

To the President and Members of the Photographic Society, London.

Port Louis, Mauritius,
April 7th, 1865.

Gentlemen,—I beg to state that I am a subscriber to the 'Photographic Journal,' and that having read in the issue of the 15th February last an extract from the 'Star,' February 6th, which alludes to my photographic process, I am desirous to amend the very flattering article in question, for the sake of truth as well as of my character.

I quote 'Photographic Journal,' No. 154, page 206:—

1. "*Photographs in Colours.*—An article on scientific discovery in the last number of the 'Revue Contemporaine,' by Dr. H. Montucci, gives a detailed account of the last triumph of the photographic art, due to the indefatigable researches of M. Chambay, who has spent the last few years at Port Louis, Ile de France. M. Chambay has succeeded in fixing the natural colours of the object photographed.

2. "The operation is as instantaneous as in ordinary cases; and, if the report be not exaggerated, the likeness obtained has all the delicate colouring of a pastel drawing and the minute accuracy of miniature-painting."

Now, the first part of the above quoted lines has been the result of an insufficient understanding of the French paper which has reported my process in the Mauritius.

I, in reality, do not "fix the natural colours of the object photographed;" but I possess a process by which the ordinary proof is transformed to a coloured one, which is exactly the reproduction of what is seen in the "camera obscura" on the ground glass.

The second part of the aforesaid article states that the likeness obtained has all the delicate colouring of a pastel drawing and the minute accuracy of a miniature-painting.

I am not conceited in adding that such a statement does underrate, if anything, the real value of my process.

Now, Gentlemen, I hope that you will not tax me with having intruded on your valuable time, considering that it was my duty to rectify facts that unwillingly might have led the public into error, and consequently thrown a bad light on my character.

I have the honour to remain,
Your most obedient Servant,
Chambay.

◆

Carbon-Printing.

To the Editor of the Photographic Journal.

Sir,—I have no intention of following Mr. Pouncy through the wilderness of words in which he has involved himself and his claims, and in which he raises a variety of questions quite foreign to that at issue. Stript from the mass of verbiage, conjecture, and vituperation, the object of Mr. Pouncy's letter appears to be to prove that he has at various dates, since December 1858, exhibited prints by his carbon process. The evidence to which he appeals are the printed records in your own and other journals: this evidence he appears to deem conclusive. I have no objection whatever to this; but I must emphatically remind him and your readers that it is to exactly the same kind of evidence I appeal to prove that MM. Poitevin and Beauregard invented and published carbon processes before Mr. Pouncy's name was heard of. This is, indeed, the only kind of evidence which can be had by photographers generally of either fact. Personal knowledge is beyond the reach of the mass of photographers. I, for one, have never seen, and have no personal knowledge of, either Mr. Pouncy, M. Poitevin, or M. Beauregard; and I, like the mass of the photographic world, can only rely on published documentary evidence—a kind of evidence on which our knowledge of half the things in life depends. From this evidence I learn that Mr. Pouncy cannot be the inventor of carbon printing, seeing that Poitevin and Beauregard had invented and described carbon processes before him.

Furthermore, although I am in no wise concerned to do so, I can now fully confirm your statement in January last, that Mr. Pouncy had "not advanced so far as to justify us in the anticipation of any very perfect results." After the very extraordinary claims made by Mr. Pouncy as to the perfection of his pictures, their equality with, or superiority to, silver prints, after what has been written by both your weekly contemporaries in confirmation of these claims, you may judge my astonishment, on visiting the Exhibition and examining with some eagerness these much-vaunted prints, to find a few small dingy-looking pictures described as intended for transfer to earthenware. These, unpromising as they were, may, it occurred to me, be unfair guides to a judgment of finished results; but, on looking further, I find examples labelled as specimens of the printing-ink process. These, I have a right to assume, are fair specimens of the capabilities of the process; they are there for the public to examine, and I would urge upon all interested in the question to make the examination. For my own part, I have no hesitation in affirming that, in my poor judgment, they are about as worthy to be compared with silver prints as one of the rude woodcuts adorning one of Catnach's ballads is to the finest mezzotinto that ever was produced by Cousin. I am loth to trespass further upon your space, but I cannot well suppress my indignation that your photographic contemporaries quoted by Mr. Pouncy in his last letter—the 'Photographic News,' the 'British Journal,' and the 'Photographic Notes'—should have so far misled the public as to bestow such unqualified praise upon productions in every sense so unworthy of approval; for whilst I can readily understand the kindness of motive which dictates encouragement to a persevering man, I cannot accept it as a fair counterbalance to an offence like that of misleading the public.

In conclusion, Sir, I am glad to endorse the opinion expressed in the report of the Committee appointed by the Council to manage the Exhibition, copies of which were circulated at the recent *Soirée*, and recommend the public to examine and judge for themselves as to how much remains to be done before presentable prints can be produced by this process.

J. Carus Crofton.

P.S. I find, on referring to Mr. Pouncy's exceedingly long letter in your last, that I have omitted to refer to a point on which I had intended to ask a question. Can you tell me the meaning of the extraordinary paragraph in which Mr. Pouncy seems to confound or identify me with the writer of a review of the year in your January number? Or will you kindly assure your readers and Mr. Pouncy that J. Carus Crofton has not the good fortune to be associated with your Journal; and as he has no connexion with the press, nor acquaintance with a provincial editor whom he can employ to take up cudgels for him, he must decline to waste his time with further correspondence on an uninteresting subject.

[We scarcely understand the allusion in Mr. Pouncy's letter, in reference to which our correspondent questions us. The "Summary of the Year," to a paragraph in which Mr. Pouncy takes exception, was written by a member of our present editorial staff, and we are solely responsible for it. Of Mr. Crofton we know nothing beyond what we derive from his correspondence, but are assured by a mutual friend that he is a gentleman of great respectability, who has been long interested in photography. As both he and Mr. Pouncy have had a fair hearing, we must for the present decline to insert further correspondence on this subject.—Ed.]

The Eburneum Process.

As promised in our last, we now give some details of the "Eburneum Process" of photography. The distinctive name, we may remark, is derived from the Latin word *ebur* (ivory). The appearance of the pictures produced by this mode of printing is suggestive of a picture on ivory; hence the name.

The first part of the process consists in producing a transparency on glass. The method of doing this is too well known to all our readers to need recapitulation here; suffice it to say that we have succeeded equally well with transparencies printed both by wet and dry collodion.

The glass plate should, before being coated with collodion, receive a slight coating of an ethereal solution of wax, according to the method first described in these pages by Mr. Wenderoth, of Philadelphia. This is then rubbed off, but sufficient will still remain to effect all that is required by this treatment.

The plate is now coated with a tough collodion, and exposed either in a copying-camera or under a negative.

The development should be conducted in a precisely similar manner to that on opal glass. Care must be taken that it is not developed so far as would be required for a good transparency, as in that case it will prove to be much overdone for this purpose, and the finished picture will be dark and heavy.

After fixing, tone the picture either by means of chloride-of-gold solution or bichloride of mercury, with the subsequent application of a very weak solution of sulphide of ammonium. The picture should now be washed, and allowed to dry spontaneously.

Having been placed on a levelling-stand, there is now poured over the face of the picture a solution prepared thus:—Put five ounces of gelatine to soak in twenty ounces of water. When it has swelled up, which it will do in a few hours, place the vessel containing it in another vessel of hot or boiling water; by this means the whole will be liquefied. Now place in a mortar one ounce of oxide of zinc, half an ounce of glycerine, and about an ounce of water. Mix thoroughly together, and then add it to the warm gelatine solution, which should be previously filtered through flannel. After stirring well together, allow it to repose for one or two hours, and decant from any sediment which may have fallen.

This is the solution which is poured over the picture. When used, it should be warmed to about 100° Fahr. The plate thus coated with gelatine should be retained in its level position until the film is quite set, after which it may be put aside in a warm place until quite dry, which will occupy about thirty-six hours. At the end of this time it may receive a coating of ether, plain collodion, or of spirit-varnish; and when this has become dry, a penknife is run round the margin of the film, which will at once leave the glass plate. The edges of the picture must now be trimmed, and the picture is finished.

The object of applying the wax to the glass plate before coating with collodion is to cause the film to leave the plate with greater certainty when the gelatine has set than it might otherwise do. Should the film show a liability to become detached during the operations of developing, washing, &c., this may be obviated by charging a camel's-hair brush with a solution of india-rubber in benzole (six grains to the ounce), and passing it round the edge of the glass to the width of about an eighth part of an inch.

It is important that the gelatine be thoroughly dry before removing it from the glass. The inventor finds that about thirty-six hours in a temperature of between 60° and 70° will effectually do this. If too short a time has been allowed for drying, the surface of the picture is apt to become dull.

By these instructions any careful operator will be enabled to practise the "eburneum process" without much risk of failure. Hurried or imperfect drying of the gelatine will prove the most common source of failure; but bearing in mind the time specified above—thirty-six hours in a warm room—this may be effectually guarded against. There is a delicacy, a tranparency, and general beauty about these pictures, which will commend the process to all who can appreciate such desirable qualities in this class of photographic pictures.

[The above process, a description of which we have taken from the 'British Journal of Photography,' is the invention of Mr. Burgess of Norwich. We are informed that that gentleman, wishing to remunerate himself in some degree, charged the sum of two guineas to those to whom he imparted the secret; he also gratuitously sent various editors the description of his mode of manipulation, one of whom at once made publicly known the details.—Ed.]

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Royal Scottish Society of Arts.

The above Society proposes to award prizes of different values, of thirty sovereigns and under, in gold or silver medals, silver plate, or money, for approved communications primarily submitted to the Society by Fellows or others, relative to inventions, discoveries, and improvements in the mechanical and chemical arts in general, and in their relation to the fine arts, and also to means by which the natural productions of the country may be made more available. The Society suggests the following as a few of the many subjects that may be attended to, viz.:—

I. Inventions, Discoveries, or Improvements in the Useful Arts.

1. *Mechanical Arts.*

Inventions or improvements in applying the motive power of men and animals—in wind and water prime movers—in steam and other heat engines, including gas engines—in pumping, blowing, rolling, sawing, agricultural, and other engines and machines—in cotton and other textile manufacturing mills—in ship-building, wood, iron, and steel—in lighthouses—in marine propellers—in railways, plant, and signals—in electro-magnetic motive power—in electric and other telegraphic apparatus, submarine and aërial—in photographic apparatus—in fire-proof buildings—in water-supply—in paving—sewerage—in economical appliances for improving the sanitary condition of towns—in smoke-consumption and extinguishing fires—in gas-works—in canals and inland navigation, including the application of steam-power to canal traffic—canal locks, inclines, and lifts—application of hydraulic power for lifts for domestic use—for cranes—for printing-presses—organ-blowing, and other similar purposes, where small propelling power is required—labour-saving machines for working in wood—in tools, implements, and apparatus for the various trades—in bricks, encaustic tiles, cements, and mortars—in printing-machines, cases, and rollers—in stereotyping—in cranes—in the machinery for collieries—in preserving timber and metals in marine works—in optical apparatus for astronomy, surveying, and levelling—in manufacture of paper—experiments on the effect of low temperatures on metals.

2. *Chemical Arts.*

Inventions or improvements in new and useful applications of gutta percha and vulcanized india rubber or similar gums—in the economical extraction of chemical principles or useful substances, as paraffine, &c., from coal—porcelain clay from granite or felspar—and metals generally from their ores and oxides—in dyes—in paints—in paper—in glass, especially for lenses—in methods of rendering the electric light available in practice.

3. *Relative to the Fine Arts.*

Inventions or improvements in photographic processes, in "carbon" printing, and in methods of printing photographs from their impressions on steel or copper plates or lithographic stones—in electrotype processes—in die-sinking—in methods of illustrating books, to be printed with the letterpress—in paper-hangings—in articles of porcelain, common clay, or metal—in glass-staining—in engraving on stone—in chromo-lithography—in "nature"-printing.

4. *Natural Productions.*

Discovery of plumbago mines—whetstones—of woods suitable for engraving.

II. Experiments applicable to the useful arts.
III. Communications of processes in the useful arts practised in this or other countries, but not generally known.
IV. Practical details of public or other undertakings of national importance, already executed, but not previously published; or valuable suggestions for originating such undertakings.

THE KEITH PRIZE, VALUE THIRTY SOVEREIGNS.

For some important "invention, improvement, or discovery, in the useful arts, which shall be primarily submitted to the Society" during the session.

THE HEPBURN BIENNIAL PRIZE, VALUE ABOUT £12.

(*If not awarded during Session* 1864–65.)

"For such inventions or communications submitted to the Society as shall be approved of by the Society, or by their Prize Committee."

THE MAKDOUGALL-BRISBANE BIENNIAL PRIZE, VALUE £10.

(*If not awarded during Session* 1864–65.)

"To the authors or inventors of communications of merit, which shall be approved of by the Society or its committee, and judged by them deserving of such distinction."

THE REID AND AULD PRIZES.

For the first, second, and third best models of "Anything new in the art of clock- and watch-making—by journeymen or master watch- and clock-makers." If these should be considered worthy of prizes, the year's interest of the Reid and Auld bequest, being about seven guineas, divided among them in such proportions as the Prize Committee shall fix, according to merit. To such as deserve it, the Society may add to the amount of the prize out of its general funds.

By the liberality of Charles Cowan, Esq., of Logan-house, the president, and his partners, the Council are enabled to offer a prize of fifty sovereigns, with the Society's silver medal, for the best communication, if otherwise approved, on the "Purifying of Water which has been used in the manufacture of Paper."

The processes employed may shortly be stated to be:—

1. The washing of "filthy rags," and other fibrous materials, for which a large quantity of pure water is requisite.
2. The boiling of such materials in an alkaline solution, and the washing of the contents of the kiers or boilers in which the boiling-operations have been conducted. And
3. The steeping of the half-stuff in chests in a solution of chloride of lime, and the washing of the partially exhausted bleaching-agent from the half-stuff.

Intending competitors are requested to keep especially in view the circumstances in which the paper manufacture is carried on on the banks of the North Esk, in the county of Edinburgh. The merits of any suggestions which may be submitted will be regarded as being of greater value—

1. By these being effected at moderate expense, and by their being applicable with as little interference as possible with the existing plant and mode of manufacture; and
2. By any substances, whether in suspension or solution, hitherto carried off in the stream, being demonstrated in practice, and by simple means, to be capable of imparting fertility to arable or pasture land, or of being profitably applied otherwise.

Communications lodged in competition for prizes shall not have been patented, nor previously published, nor read before any other Society. Patented articles may, however, be exhibited and described.

For particulars as to the form in which communications should be sent, application should be made to John Beatson Bell, Esq., Secretary, 5, Hill-street, Edinburgh.

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Exhibition of Arts and Manufactures for North-eastern London.

12 Ockenden Road, Islington, N.
May, 1865.

SIR,—I beg to call your attention to the following resolutions and suggestions of the Committee of the North London Photographic Association with reference to the approaching Exhibition of Photographs and Photographic Apparatus at the Agricultural Hall in August next; and in the event of your desiring to become an exhibitor, I shall be glad to receive an application for space at your earliest convenience, to enable the Committee to select such a position in the building with regard to light, approach, &c., as to ensure the most favourable display of the pictures and apparatus exhibited. I also beg to inform you that Medals both for Photographs and Apparatus will be awarded.

I am, Sir, your obedient Servant,
JOHN BARNETT, *Hon. Sec.*

Resolved:—

That special screens or fittings for Photographs may be used by any exhibitor at his own cost, subject to the approval of the Committee.

Carte-de-Visite Portraits will be exhibited, provided they do not exceed twenty in number from any one exhibitor, and in frames containing not more than four square feet.

Coloured Photographs will be admitted.

The Committee request that cabinet or other small pictures be mounted in sets of four, six, or more in each frame.

The Committee have the power of rejecting any pictures or apparatus that may be sent for exhibition.

All expenses of transmission to or from the Exhibition must be borne by the exhibitors, and the Committee cannot hold themselves liable for breakage or damage.

All exhibitors of apparatus must provide suitable counters and fittings for the same at their own cost.

That no application for space can be entertained after the 15th of June.

[We have much pleasure in calling the attention of our readers to the above circular, which has just been issued, and trust that it will receive the attention which it calls for. The Exhibition will take place under the auspices of an influential Board of Trustees and Council the North London Photographic Association lending their aid to secure the success of the Photographic Department.—ED.]

The latest News.

"OF all representation, photography fails the most signally to convey anything like the true idea of an object. Photography is soulless and idealess. Behind the power that traced the outlines sat no human genius: over the skill that filled in the details presided no principle of appreciating selection."

We copy the above astounding absurdity from Dean Alford's recent book, entitled 'Letters from Abroad.' The Dean puts himself forward in answer to Virgil's question "Quis audeat solem dicere falsum?" and this is how he does it. On the following page he recovers himself sufficiently to observe that he "must not waste in reflection the space which more properly belongs to description."

IT has been determined that the future Meetings of the Society shall take place on the second instead of the first Tuesday in each month. This decision has been come to chiefly that the report of our own, as well as the proceedings of the Photographic Society of Scotland, should appear as soon after the respective Meetings as possible. The day of publication of the Journal will remain the same.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

⁂ In consequence of several applications to the Editor, he begs to state he has never in any way been connected with the Polytechnic Institution, or with any photographic establishment, either there or elsewhere.

W. M. B.—You may entirely dispense with the use of cyanide. We have always used a vertical dipping-bath with saturated solution of hyposulphite of soda. Although a large number of persons may use cyanide with impunity, we have known several instances in which even the smell has caused unpleasant symptoms, without any absorption from a cut or otherwise in the hands of the operator.

T. M. and "One who has received no rights of Membership."—The Journal has been regularly forwarded to the address given at the time of your election, and never having been returned, it has been presumed to have been delivered by the post. 2. The picture of "Bringing Home the May" is delivered on the formal application or order of any Member who has paid the subscription for 1864; but it is quite impossible, from its size, to transmit it by post, and the packages by boards for protection by ordinary conveyance would prove a serious expenditure of the funds of the Society.

Dry Plates.—Major Russell's rapidly taken pictures by his new process, as described in the present Number, are placed on one of the screens of the Exhibition now open at 9 Conduit Street, and may be inspected on any occasion up to the last day of June.

J. B. B.—Apply to Mr. Nottage, London Stereoscopic Company, Cheapside. To that Company has been granted the *entire* right of taking all photographs in the present International Exhibition in Dublin.

Disappointed.—The observation is made with some sinister motive. There are a *few* of the pictures which have been exhibited before, and for these there has been some good cause for so doing. The Committee are not called on for any explanation. Look at the pictures and judge for yourself.

No. 158. JUNE 15, 1865.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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IT may possibly have been apparent to the most observant of our readers for some time past that the Council of the Society have been struggling with some difficulties of a rather occult and intangible nature. Allusions have been made to rumours in connexion with the Journal, changes have been made in its management, and other slight indications may have been perceived of the existence of matters which could not have been publicly discussed, but which were nevertheless of a most unwholesome and unsatisfactory nature.

At the last Meeting of the Society, held on Tuesday night, Mr. Glaisher, Vice-President, entered into some explanations from the chair, which leave the matters to which we have referred no longer mysterious. It appears that certain persons (whose conduct rendered it necessary that, in mercy to them, they should only be referred to under initials) have been for some time past, for what motive it is not difficult to conjecture, although unnecessary to state, writing continually to Mr. Glaisher, making extraordinary charges in regard to the management of this Journal. The Editor, it was stated, neglected to take any interest in it whatever, and that its sole management and control were surreptitiously vested in a gentleman connected with a contemporary Journal. The small substratum of truth upon which this gross misstatement or distortion of facts was based was this:—Mr. G. Wharton Simpson, the editor of the 'Photographic News,' has occasionally assisted the Editor of this Journal with his extensive practical experience in photography and journalism by the contribution of practical articles and occasional items of intelligence; and he has also, for some time past, supplied to the Journal a modified or amplified copy of the report of the proceedings of the Society, prepared for the 'Photographic News.' This was first done in consequence of the difficulty experienced in obtaining correct technical reports for the Journal. The reports in the 'News' had been pointed out to the Editor as singularly perfect photographically; and an arrangement for their amplification and transfer to the pages of the Journal was made, and continued for some time, until Mr. Simpson, becoming aware that this circumstance was seized upon for the purposes of these private letter-writers, declined to continue their further contribution. Beyond the connexion thus indicated, the Editor of this Journal has not had the pleasure nor the necessity of further securing the aid of his friend.

As we have said, these insinuations became so repeated, and their purpose so apparent, that although the letters addressed to Mr. Glaisher were marked "private," he declined any longer to be the sole repository of their slanderous contents; and, notwithstanding that he was himself, to begin with, well assured of the untruth of their allegations, he instituted a searching inquiry in order to bring forth tangible evidence in refutation of the assertions made; this he did, and brought the matter before the Council very fully on Tuesday night, and subsequently in his explanation before the Society, which will be found in our report, from which it will be seen that the fullest evidence of every person who could have the slightest knowledge of the facts was obtained and stated, and that, in reply to the

Chairman (who put his question with an apology, and asked for an answer as a favour), Mr. Simpson gave the most emphatic and complete denial to the assertions made, so far as he was concerned, and thus gave the crowning evidence in refutation of the extraordinary misstatements (to call them nothing worse) of the calumniators. We trust they are as well satisfied with the explanations given as the gentlemen whose good name was assailed are, and as the photographic public will be, with the issue of their proceedings.

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The exhibition of photographs and photographic apparatus in connexion with the Exhibition of Arts and Manufactures for North-east London will take place in August next, in the Agricultural Hall, Islington, and is expected to be a good display of specimens of the art, as well as of the means by which the specimens are produced. We are informed that, although the last day appointed for receiving application for space was the 15th inst., space may still be obtained by immediate application to the Secretary, Mr. John Barnett, 12 Ockenden Road, Islington, N.

The general exhibition will, we believe, be confined to exhibitors who reside in the district from which the Exhibition takes its name. This rule does not refer to the Photographic Department; and pictures will be received, at the discretion of the Committee, from any part of London or the country.

The following are the Rules that have been framed to guide intending exhibitors:—

"Special screens or fittings for photographs may be used by any exhibitor at his own cost, subject to the approval af the Committee.

"Carte-de-visite portraits will be exhibited, provided they do not exceed twenty in number from any one exhibitor, and in frames containing not more than four square feet.

"Coloured photographs will be admitted.

"The Committee request that cabinet or other small pictures be mounted in sets of four, six, or more in each frame.

"The Committee have the power of rejecting any pictures or apparatus that may be sent for exhibition.

"All expenses of transmission to or from the Exhibition must be borne by the exhibitors; and the Committee cannot hold themselves liable for breakage or damage.

"All exhibitors of apparatus must provide suitable counters and fittings for the same at their own cost."

PHOTOGRAPHIC SOCIETY OF LONDON.

Ordinary General Meeting.

King's College, London.

Tuesday, June 13, 1865.

J. Glaisher, Esq., F.R.S., V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The Chairman said,—Gentlemen, before we proceed to the ordinary business of this Meetting, I wish to bring before you the subject of a correspondence that I have had since the publication of the last Journal. That correspondence I now hold in my hand, and it is physically impossible that I should read the whole of it to you; and, indeed, there is no occasion for me to attempt to do so. It is a correspondence with three gentlemen, members of this Society, whose names I beg that no one will ask me to disclose. I shall call them A, B, C. They are, as I say, members of this Society; and they complain, in these letters, that your Council are not quite doing their duty, that the Editor is not doing his duty, and that, in fact, Mr. Simpson is doing all the work for us: the key-stone of all, in fact, is that Mr. Simpson is the Council, and not we ourselves. I propose to read some extracts from these letters, and, after I have done so, I will ask Mr. Simpson kindly to answer me a question, and then I think that you will understand the matter better than you can now do. My first correspondent, whom I call A, speaking of the Journal, and referring to Mr. Simpson having a proof of a paper in his possession for days before the Meeting, says, "If it is as he says, it is not fair play; and I think it right to call your attention to it. What is of more importance to the Photographic Society? I think I am not mistaken when I say that, from reading the last Number of the 'Photographic Journal,' I am pretty certain that *Mr. Simpson had a good deal to do with it. A leading article, particularly, I have no doubt, by certain internal evidence, was written by Mr. Simpson.*" Well, now, this correspondent is a gentlemen who commands my greatest respect; and, of course, it was my duty to reply to him, which I did, assuring him that, "So far as I know, no person whatever is connected with the Journal, who is connected with either of the other journals." Having made this reply, I was in hope that there was an end of the question. But then I received a letter from B, another Member of this Society, who says,

"I believe, as I believe in my own existence, that the Society's Journal is virtually managed and edited by the editor of the 'Photographic News,' Mr. G. W. Simpson."

Well, I was rather grieved to find two gentlemen writing to me in this way, and I answered the last named, that I did not think Mr. Simpson had anything at all to do with the Journal. Then A returns again to the charge, and he says, "On reading the last Number of the 'Photographic Journal' I honestly thought, and still think, that it was for the most part written by Mr. Simpson. Of course I may be mistaken about this; but in the case of the leading article, I do not think that I am; it contains a sentence almost word for word the same as one which appeared some years back on a somewhat similar occasion, in the 'Photographic News,' *and appears to me to be unmistakeably in Mr. Simpson's style.*" And in another part of his letter he says, "I know that you no more approve, than I do, of Mr. Simpson's conducting our Journal, and therefore I think it right to call attention to these matters."

Well, gentlemen, having received these two letters, I placed myself in communication with the several Officers of the Society, to ascertain whether my impression that Mr. Simpson is wholly unconnected with the Journal was correct or not. For I assure you that, in the position in which I am placed, I wish to preserve the interests of this Society in as healthy a condition as possible. It is true I have sometimes had to speak very plainly indeed, and sometimes, it may be, I have spoken rather bluntly, but notwithstanding this I believe I have never yet lost a friend in connexion with it. Mr. Simpson did report for this Journal, and, so far as I can learn, he always acted most honourably in the matter. But Mr. Simpson, seeing the position in which I was placed—I do not know how he knew it, but he certainly did seem to know that I was pestered on all sides with complaints—that he was taking the cream of every thing and giving us the worst, and that it was imperatively necessary he should be separated from the Journal, it was an exceedingly unpleasant thing to me to hear these statements, for I have always been very friendly with him; but, as I say, he eased my mind in the most gentlemanly way by resigning; and I may add that ever since he has been out of the position he formerly occupied, he has been as courteous as before; I therefore felt it my duty, not only with reference to the Council and to the editor of the Journal, but also to him, to probe this matter to the bottom. Accordingly I have been twice to Twickenham to see Dr. Diamond upon it; but I would not even take the Editor's word, and so here I have his contradiction in writing—"It is *not* true that I have in any way consulted Mr. Simpson, or has he written a line for me for months past." Of course I confined my attention to the time when Mr. Simpson ceased to be the reporter for this Society. After I had received this contradiction from the Editor, I was favoured with a communication from a third correspondent, and this gentleman (C) says, "As to the management of the Journal of the Society, it is quite notorious that Mr. Simpson of the 'News' is the 'subeditor,' and writes in it articles reflecting on individuals whom he dare not attack in his own paper."

Well, gentlemen, this is the substance of the correspondence I have received since the 17th of May from three Members of the Society; and it occurred to me that if three Members entertained these views, so perhaps did ten, twenty, or thirty, and that in answering one I was giving no reply to another. My plain duty, therefore, was to go further; and accordingly I called at the printers, and inquired of Mr. Mattress, "do you know Mr. Simpson's handwriting?" He said, "I do." Well then I said, "I must have your reply in writing, as to whether he has anything to do with the Journal." This is the reply:—"Mr. Simpson has not, as far as I am able to judge, been in any way connected with the editing of the Journal, since you met the sub-Committee at the Printing Office. None of his MS. has been received by me for insertion in the Journal, or for any other purpose."

I even went beyond this; for I inquired of Mr. Davenport, an old and respected officer of the Society, whether to his knowledge Mr. Simpson was in any way connected with the Journal, and whether, as he has to do with the funds, any money had been paid to Mr. Simpson—whether in fact he could give me any information upon the subject.

This interview was in the presence of Mr. Foster, whom I see before me now; and the answer I received was, "I do not think there is any connexion—I do not know of any." Having ascertained these facts, I wrote to these gentlemen, and I really thought I had satisfied them; but it appears I have not, for since then I have had a letter from correspondent C, in which he tells me that, with respect to Mr. Simpson's connexion with the Journal, the fact is in every body's mouth; and correspondent A tells me that, notwithstanding what I have stated, he sees no reason for thinking that he is mistaken in supposing that the management of the Photographic Journal is practically in Mr. Simpson's hands. I thought I had got over every difficulty on the subject, but subsequently one of the other gentlemen wrote me to this effect:—"I think you have satisfied me that Mr. Simpson has not written an article or a leader, but he may have some connexion with your reporter." Well, it is very true he may; I think it is very likely; reporters are sure almost to know one another; but really it is not worth going into that. But as it appeared to me that probably not these three gentlemen alone, but twenty or thirty or forty other Members of the Society might be entertaining these opinions and be fancying that the Council were neglecting their duty in the way suggested, I felt it necessary to bring the subject before the meeting, and to ask Mr. Simpson kindly to answer some questions. I went up to his office in Paternoster Row to make the inquiry by myself; but then I thought if these three gentlemen would not believe what I said of my own knowledge, how could I expect them to believe me if I said Mr. Simpson had told me. It appeared to me far better for them, for Mr. Simpson, and indeed for all parties, that I should ask him the question before the Members of the Society. I have therefore not seen nor spoken to Mr. Simpson since the last Meeting, but I will now ask him: "I shall be exceedingly obliged if you will kindly answer the question whether you did write the leader on Major Russell's paper or not; and whether since the time that you courteously wrote to me resigning your former position, you have written anything in the Journal?

Mr. Simpson,—Mr. Chairman, I will just say one or two words in reference to the singular position in which I am placed this evening, in which I am apparently regarded as "not one but all mankind's epitome." In reply to your inquiry, I may state categorically, that I did not write the article on the paper referred to, and that I have not written any article or a line of any kind in the Journal, except such as have borne my name, this year. I have occasionally during the last few years, to oblige my friend Dr. Diamond, written practical articles and occasional items of news for the Journal; but I have never in any shape or way written an article or a line commenting upon any one in critical fashion, or exercised any control, in the Photographic Journal.

The Chairman,—Gentlemen, I will merely say that that is exactly the answer I expected to receive from Mr. Simpson. It has been our wish to put our Journal in as good a position as we can; but I say "God speed to all the journals." I am glad to see when any of them progress. We do not wish our Journal to be a rival to the others, but we do wish our own Journal to have our own papers, and to be the medium through which any Society in the Kingdom may be able, independently of commercial interests, to report the proceedings of their meetings. I maintain that every Society should have its own Journal, at whatever expense it may be maintained. There is now one matter upon which I beg to be allowed to say a word, and it is this,—that while I am in the influential position to which the Council of this Society have raised me, I decline to receive from any gentleman a letter marked "Private," which contains any insinuations at all against the character of any Member of the Society. I am jealous of the honour of this Society, and of all the Members of this Society; and while I hold this position, I tell you (for I will be perfectly fair and open about it) that if I receive any such letter, I will at once hand it over to the gentleman whose character is impugned.

Party feeling of any kind ought not to exist amongst us; we are a Society for promoting progress and improvement in the art; there are great improvements yet to be effected, but these can only be secured by our cordially working together; and brethren—for let me call you brethren—let us forget these party feelings and jealousies, and let us strive to work harmoniously for the general good of photography and the advancement of the interests of this Society. Dr. Diamond calls my attention to another matter, viz., that in one of the notes sent to him it was said that a sovereign was sent to an officer of this Society for the Goddard Testimonial, but that a sum less than that sent was acknowledged with initials only. It seems that the gentleman who sent the letter enclosed a sovereign; and the Post-office authorities being very sharp, detected the coin, and deducted 8*d.* on account of it, so that only 19*s.* 4*d.* was put down. But Mr. Robinson tells me that Dr. Diamond himself paid 8*d.* into the fund, and so made up the sovereign again. One other matter, now that I am on my legs, I may mention, and that is with reference to the Rules of the Society. A Committee appointed by the Council have gone carefully through the lists of the Members, and they find that there are many gentlemen in receipt of the Journal who have not paid a penny to the Society. The Committee have determined that these gentlemen shall have no more Journals. Some gentlemen also have retired, and the Committee have come to the conclusion that in future this shall not be done without notice.

Then, again, some gentlemen who were elected in the first year and paid the first year's subscription, have paid nothing since, but yet have claimed the Journals when out of the country, although when they have returned they have refused to pay. On my own authority I have stopped those Journals, but the Council have given me an Act of Indemnity for so doing. The rule says:—

"Gentlemen residing abroad, and desirous of becoming Members of this Society, shall pay no more than the Admission Fee and first Contribution, remaining exempt from all further Annual Subscription while absent from this country. Gentlemen also already Members of the Society, who may have occasion to go abroad for any length of time, shall be excused all Contributions during such absence, provided due notice in writing shall have been given to the Secretary previous to their departure."

But it does not say that they are to have the Journal.

Although we have lost nearly 100 names, we have not lost a single Member from this ist; we have merely struck off the rotten branches, and have still left us a good nucleus f which we can do almost everything we desire if there is but kindly feeling amongst us. Gentlemen, I have made all the statements I desire to make this evening, and I sincerely hope I shall never again be placed in a similar position, so as to be obliged to occupy any portion of your evenings with explanations of his kind.

The following gentlemen were then elected, y ballot, Members of the Society:—

Mr. L. B. Buxton, and Mr. Russell Manners Gordon, of St. John's Wood.

Mr. Pettitt read the following paper:—

On Photo-Binography.

F we glance at the past history of photography, we cannot but observe that the discovery of he illustrious Frenchman has been followed p with a diligence and a success unparalleled n the history of any other art or science; very advance has been a distinctive step, and as left a footprint behind it for the guidance f all who follow and desire to explore the wonders of its yet untrodden domains.

These distinctive steps may be classed, for he most part, as notable discoveries in chemistry, mechanics, and optics. Daguerre, albot, Archer, Wheatstone, Brewster, have ecome illustrious in the annals of our art, ecause their ideas were practical, and could e grasped by those industrious and intelligent workers who, following, have filled in the minute details, and have rendered the discovees of the philosophers available and useful to ociety; and it is as one of these "busy bees" hat I have been buzzing in and out of that wonderful toy, the stereoscope, and, while admiring its wonders, have been trying to make as useful as it is beautiful. Whether "bi-ography" will prove a pot of honey I leave time to decide; but my aim will be attained if I succeed in drawing the swarm to the pot, to taste and try for themselves.

The "binograph" is produced without the aid of any special process, and differs only from the ordinary photograph in its optical value. Two lenses instead of one are used, and the resultant images, coalescing, become one picture.

As nature has blessed us with two eyes to enable us to see things as they are, and to judge of distance and form, I hold that if we are to produce a true likeness of her form and feature on our sensitive plate, our camera must look at her with two lenses; and if we want absolute truth, these must not be further apart than the distance at which she has placed our eyes. For, however charming may be the exaggerated perspective we behold in the stereoscopic landscape, we may judiciously hesitate ere we attempt the distortion of the human face.

The optical value gained by the "binograph" over the ordinary photograph consists in the infinite elaboration of the pictures (the production, in fact, of what an artist would call "quality"). The lines of the differing perspectives due to the angle at which each picture is taken, falling upon and coalescing, round off and soften each other, supplying those tender gradations of light and shade which make a finished picture, instead of a coarse, hard-outlined sketch, which the single lens, however good, must always produce in life-sized pictures. And we must acknowledge, at least to ourselves, that the hideous enlargements of life we see from time to time can never adorn our drawing-room, or be handed down to our children as things of beauty.

The two pictures before you are from the same negative; one of them is a "binograph," the other a single picture. The manipulative conditions and exposure are the same in each case; and I think they will speak for themselves. They were taken at a distance of about seven feet from the sitter; and here I may remark that in all life-sized pictures it is necessary, if you desire to see them to the best advantage, not to get nearer to them than the distance at which the lens was placed when the picture was taken.

Lenses having a short focal distance, therefore, are required for the binographic life-sized portrait, for two reasons: the first is the convenience of being able to see them with proper effect in a moderate-sized room; and the second, that the nearer you can get to your sitter, the more marked is the projection and relief of the binographic picture.

Of course there are a good many conditions necessary to be observed in the production of binographs. Mr. Ross, the eminent optician, who made my instrument, succeeded on the first attempt, and produced the perfect thing. This instrument so made, and properly used, precludes all possibility of failure, and renders the operation indeed as simple as that by the single lens. At some future time, with Mr. Ross's permission, I may have an opportunity of going fully into the details of the process, and the optical conditions necessary to success; for the present, I may generally describe it as one of great simplicity. A stereoscopic negative is taken of the sitter in the usual way. When fixed, it is replaced in the slide; the camera is now placed at a window, and all light excluded, except that entering the room through the double negative; *we now find that, at the distance from the lenses at which the sitter was originally placed, the two pictures coalesce and become one life-sized binograph.*

There is no necessity for solar camera or expensive fittings; a hole in the wall or in a window-shutter opening against the sky, and an artist's easel to hold your plate at the proper angle, are the extra apparatus requisite, and, having a double volume of light upon your sensitive surface, a very few seconds will do the work. The picture before you is an instantaneous one, and was produced and framed as you see it in less than half an hour; at a cost, minus the frame, of about 5*s.* 6*d.* It is a transparent print on glass, coated with plaster of Paris, which forms the lights of the picture, cements it into the frame, and protects it from injurious atmospheric influences. Of course, if desirable, binographic negatives can be as easily produced, and paper prints obtained in the usual way.

In conclusion, I may say that I believe the art is yet in its infancy, and that at no distant date we shall see imperishable cartoons on large plates of glass, that have passed through a furnace at white heat. This can be done, if we have but the courage to try. The small plates I have here have passed through such an ordeal. In one of them, indeed, the glass itself has been in a state of fusion; but the photograph is undamaged.

The Chairman asked whether he correctly understood that the two lenses were used at the same time?

Mr. Pettitt said they were, and they were separated a very little distance, about 2½ inches at the centre, similar to the plan in a stereoscopic camera.

Major Russell supposed the images were two stereoscopic images projected so as to converge.

Mr. Pettitt said they came entirely back to the original position of the sitter.

Mr. Mayall said there was no novelty at all in the matter. In 1849 or 1850, as some gentlemen present would remember, there were some curious experiments made at the Polytechnic Institution.

Mr. Hughes. It was in 1853.

Mr. Mayall. At all events it was some years since the whole problem was worked out on the screen at that Institution, and was exhibited for a whole season. There were two images taken first of all stereoscopically; they were then illuminated in separate lanterns, at the distance at which the original pictures were taken, thrown upon a screen about 25 or 30 feet in height, and the stereoscopic effect was given. Some of the pictures were those which he had taken of the Louvre at Paris. But while stating the fact that this was no novelty in principle, he still admitted there was great merit in drawing attention to its application to portraiture.

Mr. Pettitt asked whether there was any record to which he could be referred as to the early discovery of the principle.

Mr. Mayall said there could be no difficulty in obtaining satisfaction on the point, as the thing was seen by some thousands of people.

Mr. Pettitt said a bino landscape could not be made, as they came to a single sight at 12 feet.

Mr. Mayall stated that the specimens he referred to were pictures of statuary; as he before remarked, he did not think this at all detracted from the merit of Mr. Pettitt, because this was the first time a portrait had been exhibited: whether it presented any advantage over the single image he very much doubted; for if the single image were very carefully done in a solar camera, it had almost stereoscopic effect, particularly if taken with a large opening and a moderate aperture.

Mr. Pettitt said the binocularity of this picture was not very great. It was taken at a distance of 7 feet, and the lenses 2½ inches apart, so that it would not be very stereoscopic. The aim was to get exact truth, no more nor less, at the distance at which it was taken.

Mr. Mayall said, with a single lens of short diameter, the same effect could be produced by cutting off one half of the front, and taking an image with each half in succession, as with two small lenses 2½ inches apart, for those images in the stereoscope would be superposed. When these images were projected on the screen, the effect was stereoscopic, always supposing the magnifying instrument to be accurate, and some portion of the aberration was corrected.

Mr. Pettitt remarked that there was something gained in getting two small lenses to do the work of one large one, which might cost perhaps fifty guineas. He believed it could only be done with two separate lenses having exact values—in fact, twin lenses; otherwise there would be double lines.

Mr. Le Neve Foster confessed that he very much doubted whether any optical stereoscopic effect was produced by the arrangement referred to in the paper just read. It was first of all proposed to take two stereoscopic pictures in the ordinary way, and then bring them together on the screen. Either those pictures were absolutely identical or they were not. He believed they were not, and therefore the outlines would not agree, and so good a picture was not produced as from one negative only. If they were identical there was no more stereoscopic effect than from a single picture, nor was the picture so good as if taken with a single lens.

Mr. SPOTTISWOODE said the error seemed to him to arise from projecting it on a plane surface. If projected, as by Claudet's plan, on a rounded surface, like a block of clay, then they would be correct. On a plane surface the images were not identical and could not be sharp.

Mr. MAYALL considered that if the paper were placed on a curved surface the image would look more raised.

Mr. PETTITT said that if viewed through an opera-glass the image would be brought in front of the frame a foot or 18 inches, as solid as a block.

Mr. HUGHES hoped the impression would not go abroad that the meeting allowed the observation to pass that a stereoscopic effect could be produced from one image upon one plane surface. The principle itself—whatever illusion an enlarged image might have, and an enlarged image under the magnifying glass always appeared to have a solid projection in parts, but it was unquestionably not at all due to the principle of the stereoscope—the principle of the stereoscope was the superposition and the unison of two images in the brain and not upon the plane suface. If two images were taken, which in the brain would unite and form an appearance of solidity, when these were projected upon the screen they would never produce a stereoscopic illusion, for this reason, that in looking upon the screen each eye looked upon the same and not upon a different picture, whereas in nature each eye looked upon a different view, and because the point of projection was different, and the different points gave their own picture. While, therefore, they must feel obliged to Mr. Pettitt for this new application of an old principle, and while admitting the usefulness of discussing any attempt at improvement, they must endeavour to keep to correct principles in optics. The increased softness in the picture exhibited, he thought, might be accounted for in another way. It was quite possible that it might arise from the superposition of two images, each of them slightly differing, and each tending by their own sharpness to neutralize one another, and form a pleasing picture. It was not so much by the fact of their being taken from two different positions, and corresponding so nearly with stereoscopic effect, as by taking two different negatives and enlarging them, and those two only varying so slightly that the projected images shall not virtually destroy one another by blurring, but should so nearly approach as practically to soften one another. The question was whether this could not be done in a different way. He thought it could, and said the attempt had been made by Mr. Latimer Clark and by the Rev. Mr. Reade, by certain movement of the lens during exposure, to neutralize the oppressive sharpness which was always objected to in large pictures.

Mr. P. LE NEVE FOSTER said the idea of getting stereoscopic effect by the superposition of two small images was not new. It was taken up some years ago by a gentleman of considerable eminence in the scientific world, Mr. Smee, who showed him some pictures in which he had tried the effect; but they were extremely imperfect in outline.

Mr. HUGHES said it was Mr. Smee who started the idea of taking the picture with the Latimer Clark arrangement.

Mr. WISSON said the plan of backing up with plaster of Paris was adopted by Mr. Ross some ten years ago.

Mr. HUGHES said some of the original albumen pictures were backed up with plaster of Paris.

The CHAIRMAN proposed a vote of thanks to Mr. Pettitt for his communication, which, though it disclosed nothing new in principle, was welcome as a proof of his labour to attain good results. He hoped Mr. Pettitt would on some future occasion give them the benefit of his practical experience, and if he found that the old saying, "nothing new under the sun," was applicable to his productions, he would not be disheartened, but continue to prosecute his researches.

The vote was cordially agreed to.

The CHAIRMAN said he had now to call attention to what he might consider a child of one of their late discussions, viz. some prints on opal glass, taken that day by Mr. Mayall, according to Mr. Simpson's process, from a negative, also taken that day. It was really a beautiful production, and he was sure it would be examined with the deepest interest by every one present. He might also state that Mr. Ross, who had promised them a paper on lenses, had been too much occupied in business to prepare that paper for the present session, but he had sent a very interesting communication, which would now be read. It was as follows:—

To the Chairman of the London Photographic Society.

DEAR SIR,—I find that the exigencies of my business will for some time prevent me from writing the paper which I have promised on "the manufacture of photographic lenses." In the meantime I beg to offer, at your suggestion, a few remarks of a somewhat historical nature.

It was, I believe, about the year 1840 that the first photographic lens, attached to one of Daguerre's cameras, was introduced into this country. I well recollect this lens, which was brought to my father's establishment for some trivial repair. I took it asunder myself, and examined its construction with some degree of interest. It was a single achromatic lens composed of three lenses cemented together—*not of two*, as in the achromatic lenses now in general use. At that time the majority of achromatic object-glasses were composed of three elements, in consequence of the discovery made by the late Mr. Dollond that the outstanding colours of the spectrum were thus more completely neutralized. My father, finding that the required photographic properties would be more efficiently obtained by less complicated optical means, made an object-glass composed of two elements only, flint and crown; this combination is now universally known as the ordinary cemented achromatic landscape-lens, and is in daily use by thousands of photographers. The flattest side being next to the subject, a diaphragm must be placed at such a distance in front as to give flatness of field, while the form of the combination itself must be such as to correct the oblique pencils. When an angle of view larger than usual is desired, the front surface of the lens must be concave, because, in order to increase the quantity of subject included by a lens, the stop must be placed closer to it; and as the surface of a plano-convex lens would be unsuitable for transmitting a pencil of rays falling very obliquely upon it, it is obvious that giving a concave form to the surface will enable the rays to impinge on it under much more favourable circumstances.

But for portraiture, especially with processes so slow as were the Daguerreotype and Talbotype, it was found that a lens of the above form was deficient in rapidity. The problem then to be solved was, how to obtain the maximum amount of light with the concomitant conditions of good definition and flatness of field. Both Professor Petzval and my father were simultaneously engaged in solving the problem, and the remarkably similar results of their respective and independent investigations were published at about the same time. The resulting lenses were similar in this respect, that each consisted of two achromatic compounds, one at each end of a tube, and that the front lenses of these combinations were almost identical. In the posterior combination, however, there was a great difference: Petzval's consisted of a crossed crown glass nearly in contact with a meniscus flint lens, while my father's consisted of a meniscus flint cemented to a plano-convex crown. This was about the year 1841, or twenty-four years ago.

Another form of lens made shortly afterwards by Voightländer, who was working in coujunction with Petzval, consisted of two cemented combinations, each composed of three elements. It was thought that by the construction of this lens a larger aperture might be employed than could otherwise have been used. Many of these lenses were made, chiefly for taking portraits of children.

The first large portrait-combination which was made in this country was constructed for Mr. Collen, at that time miniature-painter to the Queen, and now residing at St. Alban's. By the kind permission of that gentleman, I am enabled to exhibit before this meeting the lens to which I am alluding, and which has now become an object of some interest in the history of photography. The camera to which the lens is attached was made to enable Mr. Collen to take small pictures on a flat surface, which, as you see, could not be done with the larger camera. The screw-movement was a step in the right direction in the construction of cameras, and to Mr. Collen the merit of this improvement is due. The larger camera, which I had originally devised and made for the lens, of course appears in unfavourable contrast with the more highly finished cabinet-work of the present day; but you will remember that it was made upwards of twenty-four years ago. It is now in a very dilapidated condition. The part to which the lens was attached, and which was made to move by rackwork, has been lost. A square board, into which the lens fitted tightly, and which came almost in contact with the sides of the camera, has also been lost; the object of this board was to prevent any light reaching the sensitized paper except through the lens. Allow me to add that the double-combination lens for which this camera was made was the first actinic lens ever produced, all its predecessors having the visual and chemical foci non-coincident. The construction of the lens and the position of the internal stops are such, that if the front combination be removed, the remaining back combination forms an excellent view-lens. The double lens now before you is the prototype of the wide-angle doublet which I have recently introduced and am now manufacturing.

It may be asked, What is the difference between this, the first doublet, and that which I am now making? Merely this: the former, the father of lenses, has those surfaces which are next to the internal stop practically *flat*, while in the latter they are *very concave*. In consequence of the great concavity of the inner surfaces, the two lenses may be placed in closer proximity, the result being an increased amount of the angle included in the picture. But it may be said, Where the lenses are thus constructed so as to secure width of angle, spherical aberration must needs be present: such indeed is the case; but in order to obviate this a stop must be used, and the greater the width of angle of view to be obtained by any given lens, the smaller must be the aperture of the stop. The effects of spherical aberration are thereby nullified, and a sharply defined image of objects falling even on the margin of the plate is thus obtained.

It has been urged, although without reason, that the performance of the doublet, owing to the greater number of its surfaces, must necessarily be slower than that of the single landscape combination. If even such were the case, the disadvantages arising from a slightly increased exposure would be nothing as compared with the gain accruing from obtaining a picture free from distortion (for I need scarcely remind you that no single lens with a stop, either in front or behind, will produce pictures free from this defect). But that the objection is not valid is abundantly proved by the experience of Mr. Frith and other eminent photographers, who have carefully and practically investigated this subject. Mr. Frith states, as the result of actual experiment, that having tried simultaneously a doublet and a single lens of the same equivalent focal length, and the same aperture of stop, the exposure required with the doublet was found to be shorter than with the single lens in the proportion of 5 to 6.

The foregoing remarks you will please consider as merely introductory to my paper on the details of the manufacture of lenses. Want of time prevents my noticing the orthographic lens, the globe lens, Sutton's triplet, Sutton's panoramic lens, and other photographic lenses both English and foreign.

Yours very truly, THOMAS ROSS.

2 Featherstone Buildings, Holborn,
June 13, 1865.

The CHAIRMAN added that Mr. Ross was with him on the previous day, and had sent down the large camera alluded to. He had also favoured them with a sight of an album containing a number of pictures taken by the Daguerreotype process in 1841. It was a collection which, in an historical point of view, was of surpassing interest, containing as it did many portraits of eminent persons, some of whom were now dead.

The whole of these pictures were taken in a yard at the back of a house in Somerset Street, Duke Street, Portman Square, with skylight overhead. The modification of lighting was effected by means of mirrors.

Count St. Aulaire was taken with this lens, on December 21, 1841. Exposure, one minute. Calotype process.

The *pose* of the pictures was remarkably good. And speaking of posing, he had the pleasure to inform the Members that Mr. Mayall, at their next Meeting, had promised a paper on posing the human figure and the construction of the glass house. Dr. Diamond also had promised to exhibit a portrait-lens that he had used in the early days of the art; and he (the Chairman) had laid him under an embargo to do so at the next Meeting.

The camera exhibited by Mr. Ross having been examined, and the details of its construction and arrangement explained,

The CHAIRMAN read a letter from Mr. Simpson, accompanying some carbon prints recently sent to him by M. Poitevin, and which were taken in 1855.

MY DEAR SIR,—The carbon prints which I send herewith were recently sent to me by M. Poitevin as the first carbon prints ever produced, being printed in 1855. Besides their historic interest as the first specimens of an important process, they may interest some photographers by their bearing upon a recent controversy, in which the production of the prints obtained by M. Poitevin in 1855 has been called for as the necessary evidence that such a process was invented at that date, and by M. Poitevin. G. WHARTON SIMPSON.

Also the following letter, accompanying some photographs of the Exhibition in Berlin, forwarded by Dr. Vogel.

MY DEAR SIR,—The accompanying photographs of the interior of the International Photographic Exhibition at Berlin, forwarded to me by Dr. Vogel, the president of the Berlin Photographic Society, may probably interest many of the Members if laid before the Society's Meeting this evening; and I am therefore induced to forward them for that purpose.

G. WHARTON SIMPSON.

The Chairman also read the following letter:—

To the Photographic Society of London.

Tabor, 21st May 1865.

MOST HONOURABLE SOCIETY,—We have invented a new method of copying photographic negatives, which promises to be an important progress in the photographic art. Our photographs are produced without silver and gold, by means of the most cheap and ordinary ingredients. The method of proceeding is also very simple, and requires no delicacy. The prepared paper is most sensitive; the duration of exposure, in the sun, 8 to 10 minutes; and the paper keeps its sensitiveness during a long time, and would, therefore, be of commercial value. By the photographs which we send, you can judge to what degree of perfection we have brought this method, not being photographers, and not working with paper of convenient quality. You will also see that in our photographs the tint of colour can be varied. In the landscape photographs you find the foreground dark, and the background blue; this produces a good effect, and is in conformity with the principles of perspective.

In reference to the durableness of our photographs, we remark that the chemicals used are SO_3HO, ClH, NO_5HO, SH. In the conviction that your most honourable Society will appreciate the importance of this invention, we offer it for a recompense of £800 sterling.

The first, T. Husník, and
The second, D°. A. Schwarzer, inventors.

Address:—D°. August Schwarzer, Gymnasiallehrer in Tábor, Böhmen (Oesterreich).

P.S. We have procured two larger negatives, and send copies of them, to show that larger copies can also be made by our method.

Some interesting photographs in various colours were exhibited as the results of the process alluded to.

A letter was read from Mr. Barnett, Secretary of the North London Photographic Association, calling attention to the arrangements made in connexion with the Photographic Department of the forthcoming Exhibition of Arts and Manufactures for North-Eastern London, and which we have referred to in our leader on the subject.

Mr. Murray exhibited a new box tent, and explained the details of its arrangement. He stated that it was constructed to carry the whole of the apparatus inside, with the exception of the tripod-legs. In designing this form of tent there were two special objects kept in view; the one was to arrange all its parts in the simplest way possible, the other was to make the box, when closed, of a convenient and portable form. The back of the box was divided; one portion was hinged to turn downwards, forming with the bed of the box a table. The other portion with the top of the box formed the roof of the tent, and it was thus practicable to have a window in the top for lighting and securing ventilation. There was also a window in the front of the box. In the arrangement of the interior, the bath was placed on one side, and the developing-tray on the other. To that was attached a flexible tube to carry off the solution. Opposite to the operator, provision was made for the reception of the chemicals. There were also the necessary arrangements for the pneumatic plate-holder, water-bottle for washing the plate, &c. The covering consisted of three thicknesses, easily arranged to keep out the light, and was, when the operator was at work, fastened round his body.

The stand was constructed upon rather a different principle to the ordinary form; that is to say, the top was made circular instead of triangular, by which means a large and firm stand was obtained, and great rigidity was given to the box itself. The plate-box was constructed especially for this tent-box. It was a combined plate box for clean plates and wet negatives. The clean plates were carried in pairs on one side; the wet plates were put into the other side, in grooves made at an angle, and of hard wood, and drained into blotting-paper placed at the bottom, which was entirely distinct from the bottom of the clean-plate side. In closing the box tent for travelling, there were doors provided to fit in front of the chemicals, in order to keep the bottles in position. Under the chest the plate-box travelled, and in front of that the camera. On the opposite side the bath was placed, and in front of it the developing-tray. The covering was then brought into its place, and the doors closed. The upper part was supported by iron supports, very simple in construction, and easily arranged.

On the motion of the Chairman, a vote of thanks was passed to Mr. Ross and to Mr. Murray.

The Chairman, in closing the proceedings of the session, said, in looking back he thought the Members would agree with him that they had been favoured with some excellent papers. They began well, and they had continued well. It would now be some time before they met again; meanwhile he hoped they would all make good use of their cameras, and be able to furnish, during the next session, some interesting results of their labours for the benefit of the Society.

The proceedings then terminated.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

We have pleasure in extracting the following observations made by the popular writer of the "Echoes of the Month" in the *Photographic News*, on the late successful session of the Photographic Society of Scotland. We heartily concur in the regret that is expressed at the resignation of the Honorary Secretary, Mr. Johnston, from whom we have always received so much courteous assistance. We well remember experiencing the same unwelcome feelings at the resignation of Mr. Kinnear; but as he was followed by so able a successor, we hope the Society will again experience the same good fortune.

"Being the conclusion of their photographic year, the Council of the Photographic Society of Scotland presented their report. This Society, now at the end of its ninth year, has much to be proud of: it has brought together, at various times, some of the finest collections of photographs that have ever been exhibited; and it was the first to initiate the practice of offering medals for the best pictures exhibited in various branches of our art, a practice which has since been followed by other exhibitions with the greatest success, and which has done much to encourage a love of true art and sound manipulation amongst photographers. Their medals have always been given with such strict impartiality to the best picture, without any reference to the expediency of rewarding any particular individual, that their reward has been the most coveted of any. The medals offered for the next competition, which will take place about next December, are—For the best view taken by a dry process—For the best view taken by an amateur by any process—For the best portrait—For the best enlargement (view or architectural subject): and—For the best enlargement of a portrait. The Council reserve power to award extra medals. All the pictures must be untouched, and from single negatives, except in the case of views, which may have the sky printed from another negative, or they may be toned or shaded before fixing. This appears to be a most judicious list of awards, and calculated to improve the art in several of its weakest places—dry processes and enlargements, for instance. There is a little inconsistency in allowing views to be printed from two negatives, and debar any other kind of picture the advantages which, undoubtedly, are to be gained by double printing; and if two are allowed, why not three, and so on? But this is only a spot which does not interfere with the brilliancy of the sun. All must regret that the Honorary Secretary, Mr. T. B. Johnston, has resigned the office he has so long and so ably filled."

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The last Monthly Meeting of the present Session was held at Myddelton Hall, Islington, on Wednesday, June 7th, W. W. King, Esq., in the Chair.

Mr. Barnett (Hon. Sec.) read the minutes of the last Meeting, which were confirmed.

Mr. T. Burr, F.R.A.S., &c., read the following paper:—

On the Application of Photography to the continuous Self-registration of Magnetic and Meteorological Phenomena, as practised at the Royal Observatory at Greenwich.

Among the numerous applications of the beautiful art-science of photography, there is probably not one that can compare in utility with the automatic registration of natural phenomena, by which a perfect and unerring record is obtained of manifestations that would otherwise be altogether lost; or if registered at all, it would only be imperfectly done, and this with an expenditure of human labour amounting to drudgery. Such results, however, are eminently unobtrusive in character; and for thousands who admire the beauty of photographic delineations of the persons they love or esteem, the exquisite scenery of our own or other lands, or the glories of architecture, sculpture, or painting, we must count only a few individuals who comprehend and appreciate the ceaseless working of the photographic record of the magnetic and meteorological instruments at the observatories of Greenwich, Oxford, and Kew, the daily portraiture of the solar spots at Kew, Cranford, and Ely, and the delineation of the lunar disk, and other occasional photographic operations connected with astronomy or physics, carried on by a few devoted followers of science.

A visit made by one of your late officers to the magnetic department of the Royal Observatory at Greenwich interested him so much that he desired to bring the subject before you, and requested me to undertake the task, to which I agreed, and at the earliest possible time proceed to redeem my promise. I may perhaps be allowed to explain that the reason for such application to me was simply his knowledge that, as an amateur astronomer and lecturer on that science, I had taken a peculiar interest in the history and instruments of the Royal Observatory, and for the purpose of my lectures had accumulated a considerable amount of literary and pictorial matter, illustrative of the buildings and their contents, in which object I have from time to time been kindly assisted by Mr. Airy, the Astronomer-Royal, and received every attention from Mr. Glaisher, Mr. Main, and other gentlemen now or formerly connected with that national establishment.

At the risk of being a little tedious in my paper, I think it most desirable to commence with some slight account of what it is that requires to be observed, the instruments used for such purpose, and the ordinary mode of making the observations prior to the introduction of photographic registration.

Most persons are familiar with the directive property of the magnetic needle; but all may not be aware that this instrument does not always point to the true north, but in various other directions at different places, and that even at any one place such variation is not constant, but differs at different times. Thus in London, for instance, nearly 300 years ago, in the year 1580, the needle pointed 10° 15′ E. of the true north; about 1650, rather more than 200 years since, it had returned and coincided with the astronomical meridian, after which it moved westward, attained its greatest deviation of 24° W. about 1818, and is now slowly returning to the north, its present error being 20° 30′. Besides this steady alteration of long period, there are much shorter regular variations, some of them being diurnal, others annual, and some coincident with the solar-spot period of about ten years. There are also sudden and violent irregularities, known as magnetic storms, which occur simultaneously all over the globe, and which are probably connected with auroræ or sudden alterations of the solar surface. It is to the researches and labours of the late Professor Gauss, of Göttingen, that we are indebted for our principal knowledge of the subject; and to his exertions it was due that the British and other governments, about thirty-five years ago, fitted out expeditions to various parts of the world, to establish magnetic observatories for a certain number of years, some of which were subsequently continued in activity.

About 1837, the Astronomer-Royal became impressed with the importance of this department of science, and anxious that observations on it should be carried on at our national observatory. Accordingly, at his request, an additional piece of ground was enclosed in the observatory domains, and in the following year the magnetic observatory erected. It is built of wood, and fastened with wooden pins, the metal iron being carefully excluded, except in the case of a portion of a stove and those parts of the clocks and instruments where it is absolutely necessary. The position of the building is about 170 feet from any other erection, and it is in the form of a cross, originally 40 feet in each direction by 12 feet wide and 10 feet high, as shown in the plan of observatory and grounds which I place before you, such plan being a beautiful photographic reduction of a larger plan with which I have been favoured by the Astronomer-Royal. The northern arm of the cross has lately been lengthened 8 feet. From the exterior of the observatory the building is easily recognized, as in front is placed the tall mast used to collect atmospheric electricity and conduct it to the various pieces of apparatus placed in the window of the northern arm of the building. The remainder of this arm forms the computing-room of this department of the observatory. The instruments are placed in the remaining three arms of the observatory, and, as to the magnetic department, are three in number. The general direction of a magnet may, in accordance with the laws of mechanics, be resolved into two or more forces acting in different directions; and the instruments used are designed to ascertain the variations from time to time—first, in the direction of a needle free to move in azimuth (that is, E. or W. with regard to the meridian); secondly, the variations in the dip or vertical plane; and thirdly, in the intensity of its horizontal force. The declination magnetometer is used for the first purpose, viz. to measure the variation, or, as it is now termed, the declination of the magnet, and the incessant alterations which are going on in this element. The instrument is placed in the southern arm of the cross-shaped building, and consists of a massive bar magnet two feet long, carried by a stirrup suspended by silken threads with as little torsion as possible, and surrounded by double-gilt boxes, having holes covered with glass for the observations, to avoid currents of air, and an oval copper bar or damper to lessen the vibration. At one end of the magnet is a frame carrying a cross of cobwebs, and at the other end a lens, which renders the rays from the cross parallel. In the centre of the room is a transit theodolite, by means of which, directed to the stars, the true meridian can be ascertained, and the readings of the direction in which the cross on the magnet is seen through the lens will give the amount of the declination at the times of observation. The cross is lighted either by a reflector in daylight or a lamp at night, as may be necessary for the purpose.

The dip or balance magnetometer occupies the western arm of the cross building, and, as its name implies, measures the angle formed by a magnet freely suspended on knife-edges and at liberty to move in a vertical direction. The dip, like the other magnetic elements, is in a state of constant change. At London, in 1773, it amounted to 72° 19′, and is now about 68°. As you are aware, when we travel northward, the dip increases until, in certain parts of the earth, the needle becomes vertical, and these places are called the magnetic poles. Sir James Clarke Ross reached one of these points in latitude 70° 17′ 5″ N. and longitude 96° 40′ 45″ W. in the year 1831; so that you see the magnetic poles are by no means coincident with the poles of the earth's axis. In all ordinary suspended magnets the dip is counteracted by an increased weight at the other end; and in the balance magnetometer, which is placed nearly at right angles to the magnetic meridian, this inclination is nearly counterpoised, the object being not so much to determine the absolute dip, which is done by separate instruments at stated times, as the variation in the vertical force. In order to measure this change, which requires much more delicate means than the variations of the declination magnetometer, a small plane mirror is attached a little out of the centre of the bar, which reflects the divisions of a scale fixed to the wall of the room, and these reflected divisions are observed with a telescope fixed near the theodolite, the motion of the magnet having been thus much magnified.

The remaining element, or the horizontal force of the magnet, is measured by the third instrument contained in the eastern arm of the room, and called the bifilar magnetometer. It consists of a magnetized bar, like the other instruments, which is suspended by two parallel sets of silk threads. If the strings and the magnet were in the same vertical plane the whole system would remain at rest; but the force of torsion is ingeniously brought into play to measure the horizontal force of the magnet. For this purpose, the suspending skeins of silk pass under two pulleys attached to a plate turning on a graduated circle with much friction, by moving which the magnet suspended from it is twisted out of the meridian to a position nearly at right angles with it. The force of torsion is, therefore, now acting antagonistically to that of the magnet, which endeavours to regain its normal bearing; and as the torsion force is constant, and that of the magnet subject to ceaseless variations, the magnet is always taking up fresh positions, and these angular changes can be connected mathematically with the forces producing them, and the share of the magnetic force in them deduced by calculation. The bar carries a small mirror, as in the last-described instrument, by which the reflection of a fixed horizontal scale is observed in another telescope precisely as with the balance magnetometer.

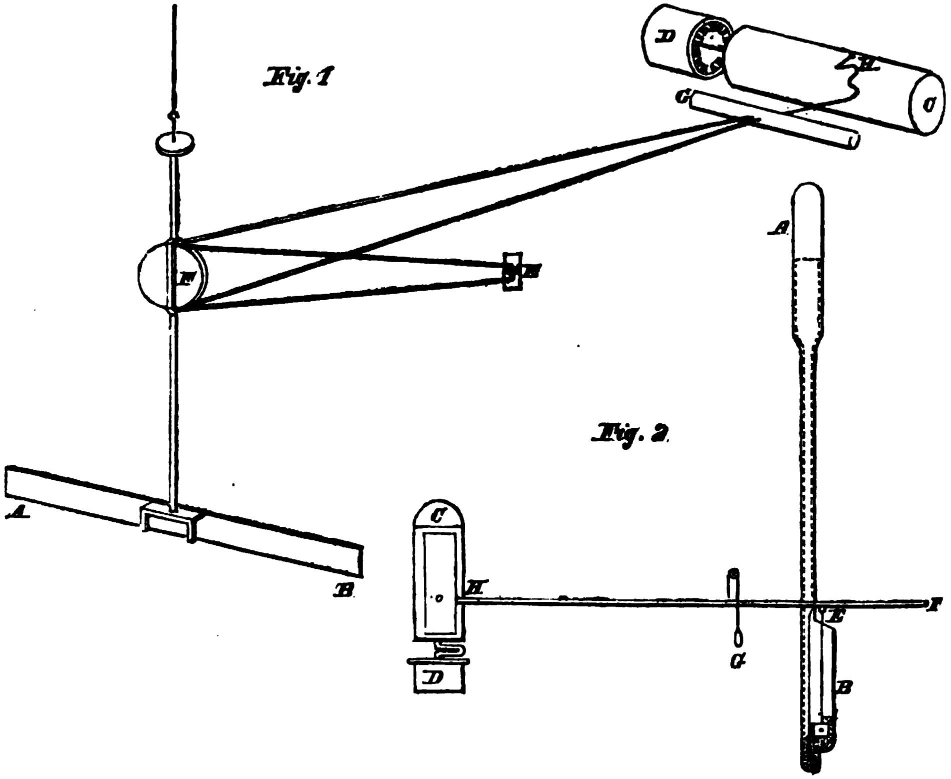
In the original arrangements of the observatory, all these instruments were observed every two hours, and on certain days in the year at every hour, which, in addition to other work of the department, fully employed Mr. Glaisher and several assistants, and was monotonous and wearisome in the extreme, as, unlike the astronomical assistants, bad weather brought them no relief of their labours. Even assuming that the observations were punctually made, it is obvious that many most important phenomena might escape notice during the two hours' interval, especially in the case of magnetic storms; and some system of continuous and automatic registration became a great desideratum. Photography was at once looked to for the required assistance; and to the inventive talents of Charles Brooke, Esq., F.R.S., the eminent surgeon and microscopist, we are indebted for the plan adopted about the year 1846, and which has since been in constant operation, for the registration of the magnetic instruments we have described, as well as the barometer and thermometers.

The photographic process employed is a paper one; and, waiving for the present all details of its preparation, we will first consider the mechanical arrangements of the apparatus. The sheets of paper, when properly sensitized, are wrapped round glass cylinders, which are, in fact, the ordinary glass shades used to protect works of art. Those used are 11½ inches long and 14½ inches round. Each shade is cemented into a brass cap having a spindle projecting from the centre. This pin and the hemispherical end of the cylinder rest on friction-rollers, in the case of a horizontal cylinder; and a wire from the spindle, bent into the form of a winch, rests in a hole in the hour-hand of a strong timepiece, by which it is made to rotate smoothly in twenty-four hours. In the case of a vertical cylinder the timepiece is placed below the glass shade, the arrangement for working it on its axis being the same. After the prepared paper is rolled round the cylinder, it is covered by another shade slightly larger, and the two are made to fit by wet tape round the mouth, and some damp wadding is also placed in the spherical end of the shade to keep the paper moist. The registration of the magnets is effected by allowing a beam of light, from a very narrow slit in the chimney of a gas-flame placed a little out of the line joining the magnet and the revolving cylinder, to fall on a concave mirror carried by a part of the apparatus suspending the magnet, and, of course, moving with it. This causes the beam of light to converge nearly on the centre of the cylinder, about 12 feet off, where it falls upon a plano-convex cylindrical glass lens, having its axis parallel with the axis of the cylinder, by which the image of the slit is reduced to a neat spot or pencil of light. The magnet, moving in azimuth, produces a spot of strong light, which runs along this lens, and, as the paper revolves under it, this light, by its actinic power, produces a continuous line round the cylinder, deviating to the right or left, and thus indicating the horizontal motions of the magnet.

A diagram of the apparatus will render this more intelligible. In the accompanying drawing (fig. 1), only the principal parts of the arrangement are represented; A B is the magnet, C the cylinder, D the timepiece, E the flame, F the mirror, G the cylindrical lens, and H the photographic trace. Originally, camphine lamps were used for the photographic light; but, for many years past, naphthalized gas has been substituted, and is equally efficient, while much more manageable and cleanly. The gas, previous to burning, passes through a box divided into compartments, containing naphtha, which is kept gently warmed by water beneath it, heated by a small flame.

Each cylinder is covered with a double case of blackened zinc, having a slit in the direction of its axis, vertical or horizontal, as the case may be, in front of which is placed the cylindrical lens. The whole course of each beam of light, from the flame to the magnet and thence to the cylinders, is also enclosed in tubes of blackened zinc, keeping out all extraneous light.

As neither the glass cylinders can be expected to be very perfect in shape nor to rotate very symmetrically, nor the paper to be always exactly alike in size, the following contrivance to obtain a base-line from which to measure the departure of the curve is used. A separate gas-flame is placed so that its light, reflected by a prism through a small cylindrical lens on the top of the cylinder, forms another spot of light on it, which remains stationary; and as the paper travels, this prints a strong line round the cylinder, which, when the paper is unrolled, becomes the base from which the distance of the curve can be measured, and its value estimated as next to be described.



In order to read off the indications thus obtained, and translate the photographic curve into ordinary language, observations are made with the theodolite in the old way, four times a day; and these give the value of the indications of the curve at those particular times, from which the value of other distances of the trace from the base-line can readily be measured by means of a scale drawn upon pasteboard. The length of the paper being not always alike, and the going of the clock likewise slightly irregular, it is necessary to have a time-scale as well, instead of simply dividing the paper into hourly parts. This is effected by shutting off the light occasionally for a few minutes from the cylinder, which, of course, leaves a white spot in the curve; and the interval between two such operations, being accurately noted, gives the time equal to a certain length of paper; and to divide this readily an ingenious expedient is adopted. A slip of vulcanized india-rubber is stretched in a frame which, by a screw, will lengthen or contract the slip; and the scale being marked on the india-rubber, it can be altered so as to make its divisions correspond with the value of the length of time measured by two breaks in the curve on the paper.

With respect to the absolute length of the photographic traces, it may be mentioned that a variation of 1° in the declination magnet is measured by 5 inches on the cylinder, and that a variation of $\frac{1}{1000}$th part of the horizontal force covers about $\frac{1}{4}$th of an inch on the paper, and the same variation in the vertical force about $\frac{1}{2}$ an inch.

The same cylinder is made to record the indications of two instruments, by being so placed that the light from each falls on different sides of it, the base-line being made between them. The declination magnetometer and horizontal-force magnetometer record their variations on one horizontal cylinder, and the vertical-force magnetometer on a vertical cylinder, which also receives the trace of the barometer, obtained in the following manner:—

The instrument is a large-bore, one of the siphon-form, having the lower face of the mercury more than one inch in diameter. This surface supports a glass float, from which rises a vertical rod. This rod is connected at right angles with a long and light lever, the greater part of the weight of which and of the float is counterpoised, leaving a small residue only pressing on the mercury. The barometer is about 30 inches from the cylinder, and the fulcrum of the lever is still further off. The lever carries a plate of opaque mica in front of the rotating vertical cylinder, having a small hole in it, through which the photographic light of a gas jet, concentrated by a cylindrical lens, passes, and records the rise and fall of the barometer, which, by the action of the lever, is increased four times in length, rendering the indications easily read off. An independent pencil of light, shining through a fixed aperture, traces a base-line, from which the heights are measured, a few eye-observations being made to obtain fundamental points.

The annexed diagram (fig. 2) shows this apparatus in detail. A B is the barometer, C the cylinder, D the timepiece, E the vertical rod, F the fulcrum, G the counterpoise, H the lever and mica plate.

Another vertical cylinder, placed under a shed in the grounds of the observatory, photographically records the readings of dry- and wet-bulb thermometers by a very simple arrangement.

The thermometers are mercurial, and have large bores, nearly half an inch in diameter. Fine wires are placed at every degree across a plate which has a slit in front of the mercury column, with thicker wires at every 10°, and extra ones at 32°, 52°, and 72°.

The light of a jet of gas is condensed by a cylindrical lens upon the thermometer-tube, and as the mercury rises or falls it obscures or uncovers the sensitive paper, and leaves a broad photographic trace on each sheet, which shows the height of the thermometer, and the exact degree can be read from the spaces of light produced by the intercepting wires. This cylinder is larger than the others, being $13\frac{1}{2}$ inches long and 19 inches in circumference; it rotates once in 48 hours, and requires no base-line.

As the preparation of the sensitive paper will probably be the point of greatest interest to you, I give it in detail from a description by Mr. Glaisher himself. In the account of the process given by Mr. Main in his 'History of the Observatory,' and in Mr. Brooke's paper, mention is made of the addition of four grains of isinglass to each ounce of the iodizing solution; but Mr. Glaisher's formula omits this. He gives the following explicit directions:—

The paper is made by Hollingsworth, and is a strong one, of even texture.

First Operation.—Preliminary preparation of the paper.

The chemical solutions used in this preparation are the following:—

1. Sixteen grains of iodide of potassium are dissolved in one ounce of distilled water.
2. Twenty-four grains of bromide of potassium are dissolved in one ounce of distilled water.
3. When the crystals are dissolved, the two solutions are mixed together, forming the iodizing solution. The mixture will keep any length of time.

Immediately before use, it is filtered through filtering-paper.

A quantity of paper, sufficient for the consumption of several weeks, is treated in the following manner, sheet after sheet:—

The sheet of paper is placed on a board, covered with oil-cloth, somewhat smaller on all sides than the paper—a condition necessary for preventing the iodizing solution from running under the edges of the paper. The paper is usually pinned on the left side of the board. A sufficient quantity (about 50 minims for a sheet of paper 15 inches long and $9\frac{1}{2}$ inches broad) of the iodizing solution is applied by pouring it upon the paper in front of a glass rod, which is then moved to and fro till the whole surface is uniformly wetted by the solution.

The paper thus prepared is allowed to remain in a horizontal position for a few minutes, and is then hung up to dry in the air; when dry, it is placed in a drawer till used.

Second Operation.—Rendering the paper sensitive to the action of light.

A solution of nitrate of silver is prepared by dissolving 50 grains of crystallized nitrate of silver in one ounce of distilled water, adding in hot weather a few drops of acetic acid.

Then the following operation is performed in a room illuminated by yellow light:—

The paper is pinned as before upon a board somewhat smaller than itself, and (by means of a glass rod as before) its surface is wetted by 50 minims of the solution. It is allowed to remain a short time in a horizontal position; and if any part of the paper still shines from the presence of a part of the solution unabsorbed into its texture, the superfluous fluid is taken off by the application of blotting-paper.

The paper, still damp, is immediately placed upon the interior glass cylinder, and is covered by the exterior glass cylinder, and is mounted upon the revolving apparatus to receive the slit of light formed by the mirror which is carried by the magnet.

Third Operation.—Development of the photographic trace.

When the paper is removed from the cylinder it is placed upon a board, and a saturated solution of gallic acid, to which a few drops of acetic nitrate of silver are added (in hot weather this solution is used at the temperature of the air, in cold weather it is heated to the temperature of 70 or 80 degrees), is spread over the paper by means of a glass rod, and this action is continued until the trace is fully developed. When the trace is well developed the paper is placed in a vessel of water, and repeatedly washed with several successive supplies of water, a brush being passed lightly over both sides of the paper to remove any crystalline deposit.

Fourth Operation.—Fixing the photographic trace.

The photograph is placed in a solution of hyposulphite of soda, made by dissolving four or five ounces of the hyposulphite in a pint of water. It is plunged completely into the liquid, and allowed to remain from one to two hours, until the yellow tint of the iodide is removed. After this the sheet is washed repeatedly with water, allowed to remain 24 hours in water, and afterwards placed within the folds of linen cloths till nearly dry. Finally it is placed between sheets of blotting-paper, and a heated iron passed over it.

The other descriptions give 8 and 12 grains of the iodide and bromide respectively to the ounce of water; but Mr. Glaisher's is the most recent and correct account of the process.

From the original records, after they have been fitted up with the necessary data of time, scales, and value of base-line, negatives are prepared in the ordinary way of photographic printing, from which duplicates of the records can be obtained and distributed when necessary. The paper used is made by Rive, and the solutions are chloride of ammonium and ammonio-nitrate of silver. By the kindness of Mr. Airy I am enabled to show you one of these secondary photograms. I have described the apparatus and observatory as it existed some short time ago; but in the course of last year an alteration was made. In consequence of the difficulty of keeping the temperature nearly constant (and if this be not done, the magnets are disturbed), an excavation was made below 3 arms of the observatory, and, being properly bricked round, the instruments have been placed in these vaults; and, as the temperature now rarely varies more than 10° from 60°, better results are obtained. The declination magnet below is a duplicate instrument, the original one being retained above for observing with the theodolite, which could not be moved, as star-transits are required to be observed with it.

The saving of labour resulting from the introduction of the automatic registration of the instruments into the magnetic observatory is at least that of two assistants, while the work is better done and continuous instead of intermitting. Observations are kept up which, in the case of such capricious changes as those to which all the instruments I have mentioned are subject, is a matter of the gravest importance.

It only remains for me to observe that, although I simply undertook to describe the arrangements at Greenwich, with which I am familiar, it is perhaps right to notice that equally complete photographic registration of similar instruments is carried on at Kew, where also the electrometers are made self-recording, and that here, even before Mr. Brooke's invention of the Greenwich apparatus, Mr. Ronalds had succeeded in recording the electrometer traces on Daguerreotype plates, and that at Oxford the meteorological instruments are likewise made self-registering by nearly similar means.

I have also to mention that, upon the occasion of the annual visitation of the observatory last Saturday (June 3rd), I found an interesting addition to the photographic apparatus. In order to detect electrical currents in the earth, two wires are stretched, the one to Dartford and the other to Croydon, passing into the earth at both ends, and having galvanometers included in the circuits. Each magnet has a mirror mounted, by which a spot of light is reflected on to another photographic sheet, mounted on a cylinder made of ebonite, and the curves are thus registered as in the other cases. The apparatus has only been mounted about two months, and it is too soon to infer anything from the results; but it may be mentioned that the Dartford current is stronger than the Croydon, that both are stronger than was expected, and that the trace of the Dartford current occasionally bears a strong resemblance to that of the declination magnetometer.

The **Chairman** said, he was sure that the Members of the Association would have great pleasure in passing a vote of thanks to Mr. Burr for the elaborate paper he had just read. The subject was one of the deepest interest, as showing how the science of photography might aid in the investigation of other sciences. It was to be regretted that the attendance of Members on the present occasion was so scanty; but it was a satisfaction to know that Mr. Burr's paper would appear in the Journal, where it would be read with great attention. The work in which Mr. Burr had been engaged was evidently a labour of love; and it was a matter which they would all deplore that that gentleman was now incapacitated from pursuing those astronomical studies to which he had hitherto devoted his attention. The paper with which he had favoured the Association proved how thoroughly capable he was of investigating such questions, and how great was the loss which the interests of science sustained through his being obliged to discontinue his researches.

Mr. **Burr**, in acknowledging the vote of thanks, which was very cordially adopted, said he had brought with him a volume of the Greenwich observations, showing the declinations which had been deduced from the magnetic records.

The **Chairman** exhibited some tannin negatives of views taken by him at Burnham Beeches, &c., which were examined with much interest, and led to numerous inquiries. He said, as this was the last meeting of the session, he thought it important to impress upon the Members that during the recess they should take up some definite line of experiments, in the same way that the Manchester or the northern Societies did, with a view to obtain good results. If they all worked to that end, he had no doubt some interesting and valuable discoveries would be made. The views he now exhibited were selected promiscuously. Some of them had been exposed under very difficult circumstances. The day on which they were taken was dull, and, on account of the large stop used, the details of distance were not always good. They were taken with the full aperture of a Dallmeyer lens; Hughes's collodion was used with alkaline development, and a 15-grain solution of tannin. He hoped that when they met again, they would be favoured with a good display of the vacation-work of the Members. The meetings of the London Photographic Society had been considerably enlivened by the beautiful photographs which from time to time were placed upon the table; and if the Members of this Association would follow the same plan, a greatly enhanced interest would be felt in their proceedings. Some of the Members were first-rate photographers, and it would be a great source of gratification if they would adopt the suggestion he had offered.

After a short desultory conversation, the session was brought to a close.

The Dublin Exhibition—Photographic Department

The Exhibition was opened in state on the day appointed, the 9th of May, by His Royal Highness the Prince of Wales. Notwithstanding the immense exertions that had been made to bring the contents of the building into something like order, the state of chaos that reigned during our visit immediately after the opening day (although greater progress seemed to have been made in the photographic department than in any other) rendered an earlier review of the photographs exhibited impossible. We have therefore considered it more just to the exhibitors to delay our notice of the principal contents of the photographic department of this Exhibition until next month, when we shall be able to make it much more perfect and complete.

We have very great satisfaction in noticing that photography has had greater justice done to it in this Exhibition than in the International of 1862. It is classed amongst the Fine Arts, and at the same time it retains the medals not awarded to other departments of the same class—painting, sculpture, and engraving. It is respectably lodged in three well-lighted rooms, about 30 feet square, and, being on the ground-floor, a tedious staircase like that which led to the photographs in the central tower of the 1862 Exhibition has not to be climbed to reach them, acting, as it then did, as an insurmountable barrier between the photographs and the public. For all these advantages photographers have to be grateful to the indomitable perseverance and indefatigable energy of the principal manager of this portion of the Exhibition, Sir J. Joscelyn Coghill, whose gentle courtesy in his communications with photographers when he was collecting specimens won the goodwill of all, and secured many works for the Exhibition which would not otherwise have been sent.

The catalogue (the first editions of which, by the-by, were not so complete or instructive as they might have been) contains the best names in the art, with scarcely an exception. Mr. Bedford exhibits a splendid collection of his inimitable landscapes. Mr. Robinson has sent a complete series of his well-known works, pictures that will be mentioned when the history of photography comes to be written in future time. Mr. Mudd has a series of prints from collodio-albumen negatives, superior to the results of any other dry process yet invented. Mr. England's pictures in Savoy and Switzerland will attract much attention. Messrs. Joubert, Claudet, Mayall, Silvy, and others worthily represent portraiture. Messrs. Lock and Whitfield exhibit some Royal portraits; one, probably from the fact of its being a portrait of the Prince of Wales, has obtained the post of honour. Mr. Rejlander exhibits a large number of studies from life, which, we are sorry to find, do little towards securing the high reputation his first works promised him. Mrs. Cameron's poetical but badly manipulated portraits and groups occupy a considerable space. Mr. Brothers exhibits some interesting specimens taken by the aid of the magnesium light; and Messrs. Marion and Son send some of Mr. Thurston Thompson's superb copies of Turner's pictures.

Amongst processes are specimens of Swan's carbon, the Wöthlytype, and the Simpsontype; some brilliant specimens of the latter process are very charming.

The apparatus is exhibited in Section X. (A), Philosophical and Photographic Instruments. Mr. Dallmeyer and Mr. Meagher have sent very fine cases; otherwise the collection is small.

Besides the British collection, the foreign division contains a few photographs, which we shall notice when we go through the Exhibition more in detail.

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The Extraordinary Charge against the Photographic Society.

Sir,—In the singular inquiry and explanation at the last meeting of the Society, in reference to the management of its Journal, I answered the question put to me by the Chairman briefly and categorically, in order the more completely and emphatically to aid in rebutting the charge which appeared to have been made against the Council, the Journal Committee, or the Editor, or all of them. It has since occurred to me that this charge, primarily intended to damage others, has a reflex bearing on myself. I might regard it, indeed, as a compliment to my energy that I am supposed to discharge my own duties (no light ones), and have time to spare to do the duty of the Committee and Editor of the Society's Journal; but as it implies also that I write articles, or express opinions, the responsibility of which I wish to avoid, you will permit me, perhaps, to say one word on that subject. I have never, during a nearly twenty years' connexion with the periodical press, editorial and contributorial, written an article or a line the responsibility of which I would have shirked, or which, but for the usual impersonality of periodical and journalistic writing, I would have hesitated to indorse with my name. Will the persons whose conduct in this matter has been so disreputable that Mr. Glaisher, with a merciful forbearance, felt it desirable to veil their names as A, B, and C, in like manner indorse their position by the publication of their names, that the photographic world may know to whom they are indebted for malicious fabrications calculated to endanger the very existence of the Society?

G. Wharton Simpson.

Mr. Editor,—I attended the last Meeting of our Society, and was surprised by the unusual proceeding of the Chairman inviting ou attention to certain correspondence he had received from three Members, reflecting on the character of a fourth. The Chairman very satisfactorily showed that he had investigated these charges, and found them utterly false from beginning to end; and, by way of entire confirmation, he appealed by name to the fourth Member to publicly state whether he had done that which had been so confidently affirmed. The Member thus addressed, Mr. G. Wharton Simpson, indignantly made the denial; and so far the matter was allowed to end.

The Chairman acted, I am sure, with the best feelings and intention in thus suppressing the names of the accusers; but surely an act of injustice was done to the accused? It is quite unfair, and certainly un-English, for a gentleman to be challenged and not know who his challengers are—to have malignant and slanderous assertions to refute, and not to know from whom they proceed. Had I been in Mr. Simpson's place, I should have stated that while I was fully prepared to deny in the most emphatic manner what had been affirmed, yet, being thus unexpectedly and publicly addressed, I should decline making any statement until the names of my accusers, and the evidence on which they based their assertions, were as publicly stated.

It is something quite new for a man to be called on publicly to defend himself from the attacks of persons who shrink to appear, but who mask their slander under the seal of privacy. Let a case be established before you call on the defence. Surely a man should not be called on to *disprove* that which has not been established. The onus of evidence must rest on the accusers; and in this case their names are concealed under the letters of the alphabet, whilst that of the accused is publicly proclaimed. My opinion is that, if one name were mentioned, the three others should have been also; if the three were suppressed, the fourth should be suppressed too. Altogether I think a clever Member has received bad treatment at the hands of the Society, first in having his fair fame and name assailed by three Members cowardly protecting their charges under the shield of privileged communications, and then being called on in the presence of his fellow-members to disprove the same.

I am sorry the Members were not allowed to express their opinions on the subject, so that they might have expressed their indignation. A PRIVATE MEMBER.

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On Dry-plate Photography.

To the Editor of the Photographic Journal.

7th June, 1865.

SIR,—From the way in which Mr. Leahy's discovery is spoken of in a leading article of the last Number of the 'Photographic Journal,' it might be inferred that I took my idea of alkaline development from that gentleman. Now had I done this, I should not only have been guilty of appropriating another man's ideas without acknowledgment (a point on which I have been most scrupulous), but also of telling a parcel of deliberate falsehoods, for the purpose of robbing Mr. Leahy of the credit due to him. A short account of the history of the matter, as far as I am concerned, will clear me of any suspicion of the kind. My idea of an alkaline developer, as I have already several times stated, was suggested by certain American experiments; by rightly interpreting these I was led, some time in September 1862, to try the effect of pyrogallic acid and ammonia as a developer. Some of the first trials were quite successful; and all that remained to be done was to find the best strength and proportions of the agents, and to test more accurately whether any advantage was gained. In the last sentence of a communication to the 'Photographic News' of the 24th October 1862 (vol. vi. p. 507), I announced, but, for reasons then given, did not describe, my new method of developing; having just returned, after an absence of a fortnight, my experiments were not sufficiently complete when I wrote. In an article in the 'British Journal,' 15th November 1862 (vol. ix. p. 425), my method of alkaline development was described. I cannot now ascertain the exact time at which this account was written; but it was before the appearance of Mr. Leahy's letter in the 'Photographic News,' 7th November 1862 (vol. vi. p. 540)—if I recollect rightly, so long before, that my communication was later than Mr. Leahy's only because the 'British Journal' was then published once a fortnight. It is evident from these facts that Mr. Leahy's discovery and mine were entirely independent of each other.

Mr. Wardley's method in no way led to or suggested mine. I have never used pyrogallic acid alone to develope, except a few times for experiment, when I found that it would not answer at all in my way of working. In my hands, the application of pyrogallic acid alone to tannin-plates has always been positively disadvantageous, whether the pyro was afterwards mixed with nitrate of silver or with ammonia. As far as I can judge, from a very limited experience in this way, pyrogallic acid alone (that is, without any trace of nitrate of silver or alkali) will not develope, except in the presence of some organic combination of nitrate of silver, such as that formed by albumen and that with some kinds of decomposed collodion. (I observe that Mr. Wardley, in a paper recently read at Manchester, 'British Journal,' vol. xii. p. 288, recommends the addition of nitrate of silver to pyro before applying it to a tannin-plate.) Pyrogallic acid will, I think, as far as we know at present, develope only (1) with nitrate of silver; (2) with organic compounds of nitrate of silver (some of which are not easily decomposed by haloid salts); (3) with an alkali, when the impression of light is on bromide of silver. When the subject is better understood, I have little doubt that it will be found that in all these ways the action produced by the decomposition of the pyrogallic acid is much the same, but in the first and second cases the decomposing agents are closely allied, and totally different from that in the third.

I have never seen one of Dr. Hill Norris's sensitive dry plates, and, knowing nothing about them, could take no hint from them.

In making these statements and explanations, I have not the slightest wish to detract from the credit due to any one, nor to claim any credit myself, caring very little whether I get any or not; nor do I wish to contest priority of invention or publication of anything, but I do wish to clear myself from any suspicion of dishonest appropriation.

In your account of the last Meeting of the

Photographic Society, I am represented to have said that relief "was generally caused by piling up"; this is not exactly what I said, and does not quite agree with my opinion; what I did say was, that relief was generally thought to be caused by piling up, or words to that effect. I might have added that it is too often caused in this way. I know that intensity and relief can be obtained without any piling up when pyro and nitrate of silver are used.

A practical hint, in answer to Mr. W. King, is omitted in your report. What I said was, in substance, that though keeping a few days after exposure made no appreciable difference, yet that the invisible image gradually faded; and if to be kept a month, I thought that the plates should be exposed about half as long again as if to be developed at once.

In answer to your expression of regret that I did not give more particular details, my plan was to give all important improvements on my original method with bromide of silver; and, in addition to this, I thought it better to give a connected history of my experience, and the facts and principles to which it had led me, than merely to repeat formulæ and manipulations which had already been published. Both could not be done in one paper. It has since struck me that two more points might have been given, as, though they had been published, they do not appear in my original directions. These are:—1st. That if irregular streaks in the direction of the dip (seen only by transmitted light), or gelatinous lumps, which look as if pushed out from behind the fibre, appear after exciting, the bath is not strong enough for the collodion; the one must be strengthened or the other weakened. 2nd. It is better not to wash off the tannin in a dish, as a muddy sediment is afterwards formed, the slightest trace of which will cause smears on the next lot of plates washed in the same dish. C. Russell.

Mr. Ross's Doublet Lens.

In the report of the last Meeting of the Society, the following observations by the chairman, Mr. Glaisher, after reading a letter from Mr. Ross, accompanying some specimens which had been produced with his Doublet Lens, were inadvertently omitted, in consequence of the short-hand writer not having transcribed them from his notes:—

"The Chairman.—I have had a great deal of pleasure in looking over a number of pictures forwarded to me by Mr. Ross, and which he tells me were taken by his doublet, a small diaphragm having been used $\frac{1}{50}$th of the focal length, or one-fifth of an inch nearly. The pictures are very beautiful indeed, and free from any trace of flare, the centre of the pictures being as free from this kind of defect as the edges. Some maps are now on the table, the production of the same lens. Maps are severe tests for curvature of marginal lines, and they show that the lens is free from distortion in this respect. I am glad to hear that Mr. Ross intends to give us a paper on his experience in lenses. The name of Ross carries a great deal of weight with it."

The New Lenses.

Our attention has also been called to the omission, as reported in the 'British Journal,' of the following remarks by Mr. W. D. Clark, in the discussion that took place, at the last Meeting of the Photographic Society of Scotland, on a communication by Mr. Ross.

"Mr. Clark stated that he had been trying the Ross doublet, the Darlot doublet, and the triplet, on the same subject—Holyrood Abbey. He exhibited the negatives from each of the lenses, and he stated his opinion generally that doublets with a wide angle gave a full flood of light in the centre, accompanied by a very marked falling-off at the edges. The illumination of the Dallmeyer triplet No. 2 was much more equal, and the lines equally straight, while the perspective was not forced, as it seemed to be by the doublet. So much so was this the case, that on seeing his picture on the ground glass he did not know it. He had also been testing the new single lens of Dallmeyer on the same subject; but the lines were so much distorted, that it was evident it had never been intended for architectural subjects."

The Origin of Carbon Printing.

[At the last Meeting of the Photographic Society, Mr. G. Wharton Simpson exhibited some Carbon Prints made by M. Poitevin in 1855. We extract the following remarks on them and the Carbon controversy from the 'Photographic News.']

A controversy as to the discovery of carbon printing has, from time to time, for years past, occasionally been carried on in the various photographic journals, and has been made to assume larger proportions than its intrinsic interest would have warranted, by the persistency with which it has been renewed, and the bitterness frequently imported into it. We are almost weary of the subject, we feel certain that photographers are also, and we now merely recur to it, and that very briefly, because we think we are in a position to settle it definitely by the production of the evidence which has often been demanded.

It will be necessary, and we shall do it very briefly, to recapitulate. In 1855, M. Poitevin discovered and patented a method of producing photographic impressions in carbon on paper. In 1858, Mr. Pouncy published a process of producing photographs in carbon on paper. Both these processes were based essentially on the same principle, viz. the action of light on a mixture of a chromic salt and soluble organic matter, in rendering the organic matter insoluble, and capable of holding or imprisoning a colouring-matter of carbon or other pigment,—the principle having been discovered and published by Mr. Mungo Ponton, in 1838. Mr. Pouncy (or his friends for him, or both) has, from time to time, asserted that he was the originator of carbon printing, basing his argument on the ground that no one (of course no one whom he knew or had had communication with) had seen one of M. Poitevin's carbon prints, and that there was no evidence that, although he had published his process, he had ever produced anything by it. The argument based on the assumption that no one had seen one of M. Poitevin's carbon prints of 1855 now falls to the ground: we have four before us as we write.

We know that for those sensitive to open vituperation or, strange to add, private slander this is a dangerous controversy to engage in. Want of patriotism, in upholding the claims of a foreigner, has been one of the common-place charges frequently made. But truth is of no country; the heroes of science and benefactors of mankind belong to the world. M. Poitevin possesses a name too honourably associated with photographic discovery for any lover of the art to disregard his claims. He has, in our pages, from time to time, seen these extraordinary pretensions, and although tempted, at times, to answer them, he has, being closely engaged with more important subjects, left the matter, feeling his reputation safe in the common sense and just feeling of English photographers. He has now, however, more for our satisfaction, and in recognition of our fair defence of his claim, felt that it was due to us to place before our eyes specimens produced in 1855, the existence of which has so often been denied.

The specimens which M. Poitevin has forwarded for our inspection consist of a print from a half-plate portrait negative, a view of a factory (we believe that at which M. Poitevin was then chemist and engineer), and two small reproductions. All are rough and with the imperfect characteristics of first essays, but with full indication of the promise of the process. The memoranda written on two of them are as follows:—"Premières épreuves de photographie au charbon, Gouhenans, 1855;" the others have the same date and similar words, and all are signed "A. P." So far as such things can do so, they possess internal evidence of their age and character. It happens, somewhat singularly, however, that there is other evidence on the subject. A long trial, which has been closely contested, has just been settled in France, in which, after a very complete investigation of claims, it has been decided, before a high legal tribunal, that M. Poitevin is the inventor of carbon printing, and that there is evidence that his productions were publicly noticed in 1855. We shall not now say anything further on the subject, as we regard this evidence as settling the historic question without the possibility of further question or cavil. It is probable that we shall exhibit the specimens at some photographic meeting, before returning them to M. Poitevin, who naturally treasures them as the first results of the discoveries in carbon printing, photolithography, and helioplastic engraving, in which he and others have made so much advance since.

Photography and its quondam Friends.—The editor of the 'Art Student' (a monthly journal, which from its slow progress seems scarcely likely ever to become an Art Master), who has affected to take a great interest in photography, especially as applied to art, appears to have suddenly changed his opinions. In the following paragraph he implies that there would be wisdom in photographers "eating humble pie" and giving up their claims to art:—

"Photographers are strange animals. They were awfully indignant with the classification of their art in the Exhibition of 1862, and filled the papers with their complaints; and now one of their London Societies, superintending an exhibition of photographs in connexion with the North London Exhibition of Arts and Manufactures, has adopted precisely the same classification, expressed, we believe, in the very same words. Have they grown wiser and eaten humble pie?"

This is too bad from one who has at least attempted, whether successfully or not, to make the art his profession. It is fortunately not true. The North London Association very properly made it a *sine quâ non* that photographs should be classed with paintings and sculpture before they consented to act, which was done at once.

The same gentleman recently read a paper at the South London Photographic Society, purporting to be "A few Thoughts about Photographic Art Progress." The paper contained much vague declamation, but the "thoughts" were very few indeed and very feeble. The chief aim of the speaker seemed to be to decry the quality of the photographs generally exhibited at Conduit Street, and to laud himself and Mr. Rejlander, the one as the only exponent and the other as the only illustrator of Photographic Art. Mr. Rejlander did much, some years ago, to illustrate the art capabilities of photography, but surely it is not just to hold him up to ridicule by pointing to him as an example of technical excellence! It is a pity that Photographic Societies cannot be protected from these unmeaning and wordy declamations on Art, which,

> "Full of sound and fury,
> Signify nothing."

Would it not be well to remember that example teaches better than precept, and to ask the question, Has Mr. Wall ever produced a photograph, or, if he have, has he ever had the courage to show it to any one?

Mr. Robinson's "Autumn."—The 'Photographische Mittheilungen,' a German publication devoted to photography, edited by Dr. Hermann Vogel, whose photographic discoveries are well known to our readers, has presented to its subscribers a small but delicately beautiful copy of Mr. Robinson's last great picture exhibited in 1864, entitled "Autumn." This picture, with "Bringing Home the May" and other of Mr. Robinson's productions now in the Berlin Exhibition, have created a great sensation amongst German photographers.

Absence of Actinism.—In our experience we have met with a few apparently fine cloudless days which have been almost useless for photographic operations, owing to the bad character of the light from the absence of actinism. Thursday last, the 8th of June, was one of these days. In photographing some landscapes, we found that with ten times the usual exposure we could not obtain a satisfactory result. That this was not an isolated instance; we might state that we have had complaints of the same absence of light on the same day from several photographers living in different parts of England. As this is a curious scientific fact, we should be glad to hear from any photographer who noticed this peculiarity on the same day.

News from the Pyramids.—The following extracts are by Professor Piazzi Smyth:—"The time had arrived for trying photographs of the interior of the Pyramid, by the aid of the magnesium light; and such were eventually procured, but under extreme difficulty; for the ancient ventilating channels of the 'Chamber of Five,' and with that of the whole interior, being thoroughly plugged up with sand and stones, which our small party was quite unable to extract, there is a sad deficiency of oxygen in the atmosphere, and the candles, burning with a small flame, showed that the magnesium itself was being used under drawbacks, though giving by comparison a brilliant semi-solar illumination. * * It was rather slow work, from the number of hours required after any one experiment to allow the smoke or fumes to subside; and if, in the meantime, a party of thirty or forty travellers from a mail steamer just arrived at Alexandria or Suez rushed in tumultuously, each of them attended by three or four Arabs, with candles and torches and pipes, and would insist on seeing everything, and then perhaps dancing a comic hornpipe on the most distinguished part of the whole floor, such an amount of fine dust would be raised as to dull every sort of light when viewed through a few feet of it, and so contaminate that secluded portion of air for more than twenty hours after. * * In by far the greater portion of the photographs the painted measuring-rods are introduced, so as to make the pictures really useful."—*Athenæum.*

The Opalotype. By Charles A. Seely, A.M.—Several years since, when the picture now known as the Ectograph was occupying my attention, I acquired a considerable practical experience in the processes now used for producing porcelain pictures. Some of the most important conclusions arrived at in these experiments are as follows:—

1. No development process gives uniformly satisfactory results in the dark parts of the pictures. It is very difficult to secure clearness and definition in the shadows.

2. Of development processes, the albumen is to be preferred to the collodion process. The tendency to fog is less, and the process is more certain. The albumen process is, however, much slower and more troublesome in manipulation. But while too slow for the camera, it is well suited for contact printing.

3. The best results are obtained by direct contact printing, either with chlorized albumen or collodion.

I have now almost daily opportunities of confirming these conclusions from the porcelain pictures which come under my notice. Nearly all of these pictures are made on collodion by development, and they almost invariably betray their origin in a general fog and a confusion in the shadows. I have never seen a clear and vigorous picture developed on collodion. The only porcelain pictures so made, which can at all compete with paper prints, are such as have been made from thin negatives, or with collodion of feeble intensity.

In direct contact printing on collodion I found difficulties; the greatest perhaps was the dissolving of the image in the fixing-solution. But when all works well, there is no plain photograph which can compare with such a picture. The printing-frame used was such as is now used by some for the porcelain picture.

Mr. Simpson's process, so far as I know, is entirely original with him, and probably will yield as good results as the old chlorized collodion processes. Unfortunately, the ordinary porcelain glass, on account of the unevenness of surface, is not adapted to contact printing. Until we have perfectly flat glass, I despair of seeing a good opalotype, except such as have been improved by the artist.—*American Journal of Photography.*

A Photographer captured by Brigands.—We regret to hear that Mr. Moens, a well-known amateur photographer, has been captured by brigands in Sicily. His companion at the time, who was afterwards set at liberty, has sent a long account of the capture to the 'Times,' from which we make the following interesting extracts:—He says, "Having been informed that all the country round Salerno was free from brigands, I, with Mr. Moens and our two wives, drove from Salerno to Pœstum on Monday last, the 15th of May, to take photographs of the ruins. Having finished our business, we left Pæstum about 4.30 P.M., and had a pleasant drive for about an hour, when suddenly, about two miles the other side of Battipaglia, I saw some men with guns walking through a corn-field on our right towards the road. In a few seconds, more rose out of the corn, and looking back I saw others hurrying through a field on our left. The carriage was stopped, and I and my friend were told to come down. The brigands immediately hurried off with us towards the sea, which is at no great distance from the road, leaving the carriage, with the ladies in it, untouched. We moved about woods and fields for an hour or two, the brigands breaking down the hedges to make it as easy as possible for us to get through. About sunset we sat down, and cloaks were given us to put on, and others to sit upon. When it was quite dark we moved on again, passing through irrigated lands and over small streams, the brigands being very careful of us, lest we should wet our feet. At last we came to a stream which it was impossible to cross without wading, and one of them carried us over on his back. We soon afterwards crossed the road from Salerno to Pæstum, and about 1 o'clock A.M. arrived at the banks of a stream some distance above the plain. The brigands told us to lie down among some bushes; but, on our objecting that the ground was damp, they let us lie down higher up, saying we must, however, conceal ourselves among the bushes when it was day. They collected dry roots for us to sleep upon, gave us an additional cloak to keep us warm, and one of them very tenderly and gently raised up my head, put some more dry stuff and a pocket-handkerchief under it, placed another over my eyes to shade them from the moon. We had as much bread and sausage as we liked; tobacco was also offered. We now asked the brigands, as we had done before, what they could get by carrying us off; told them we were not what they supposed, 'rich English milords,' but poor men; that the money we had we would send them if they would let one of us go to Salerno to get it. They considered our proposal, asked what money we had with us; we took out three napoleons and some silver. The captain of the band at once gave back the silver, but kept the gold in his hand. I offered him my watch and gold chain, but he would not touch these. After a time he gave us back our napoleons." After some further details, he says:—"Our case was then again discussed, and the brigands agreed to send one of us (and the lot decided that I should go) and collect some money among the English in Naples, and in a week's time I am to send a letter to say how much we can collect. I had not left the brigands more than a minute or two when, coming to the brow of the hill, I saw troops and National Guards approaching. In a few seconds I was surrounded by soldiers with, as I thought, *North* Italian countenances, calling out, 'Are you an Englishman? An Englishman, an Englishman!' They seized my hand, and one cried, suiting the action to the word, 'I must give you a kiss.' The good fellows thought I had escaped at their approach. In a few seconds firing was commenced by the National Guard. I hurried up some rising ground, and looking round when I got to the top, the brigands calling out, 'On, on, or we will kill your companion.' I, of course, obeyed, and on reaching Monte Corvino received an enthusiastic welcome. The inhabitants would not let me leave that night, but sent a courier to Salerno with a letter. The deputy of the town in the Italian Parliament received me into his house and took me to the *café*, where the people all crowded around me, numbers seized my hand, one or two kissed me, and many looked as if they wished to do so. My position is one of terrible responsibility, anxiety, and doubt; for the cruelties committed by the brigands upon their prisoners are sometimes horrible, and literally indescribable. They are untutored savages, without either forethought or principle, gentle and generous, or fierce and covetous, according to the whim of the moment. In Salerno a man was pointed out to us who had lost one ear in the following manner:—After his capture by the brigands, his wife, having sent a smaller sum than they asked, the brigands sent her one of his ears, with the message that if the rest of the money did not come his head would follow." The ransom first asked by the brigands for Mr. Moens's life was £8000. They have since raised the amount to £10,000. In the House of Commons on Thursday night Mr. Layard said, in answer to a question, that everything had been done which possibly could be done on behalf of the unfortunate gentleman, and he might add that the Italian Government were doing even more than they had a right to expect, in order to obtain his release. All that he (Mr. Layard) could say was, that within two hours they had received information that Mr. Moens had been seen, that he was well, and as far as possible was taken care of by the brigands by whom he was seized, and it was hoped before long he would be released.

The Wöthlytype.—Mr. V. M. Griswold, in a letter to 'Humphry's Journal,' makes a claim to the use of collodion as a vehicle for sensitizing solvents applied to paper for the last six or seven years, and says that he is preparing for publication a new process, which he asserts will be much superior to the Wöthlytype as at present patented. He entirely denies the novelty of the Wöthlytype process. We do not suppose that Mr. Griswold alludes to the specific use of the salts of uranium alone.

We notice remarks in our Jersey contemporary in relation to an article, on the photographic productions of the Misses Bertolacci, which appeared in our last. The assertion is there made by the Editor, that he believes Mr. Thurston Thompson to be the author of the article in question. Mr. Thompson has never, under any circumstances, written any remarks in the 'Photographic Journal,' nor has any such article been written at his suggestion. He was perfectly unaware of the occurrence of such observations until they were in type. The Editor is solely responsible for all leading articles; and this is well understood to be the case in all respectable portions of the English press. In connexion with this notice Mr. Bertolacci, the father of the young ladies, writes that he subscribed a certain sum to the Goddard Fund, sending the amount to the Editor of this journal, and that a smaller sum was credited to him in the subscription-list. A sovereign having been sent to us by post, the authorities of that office, wishing, very properly, to discourage temptation being thrown in the way of their servants by the transmission of loose coin in letters, imposed a *double* registration-fee of eight pence; but that the fund should not suffer from the folly of the subscriber, although we only credited him with 19*s.* 4*d.* in the subscription-list, we made up Mr. Bertolacci's shortcomings by paying the balance out of our own pocket. We thought Mr. Bertolacci wished to make an anonymous donation, and that he had no desire to advertise his daughters' photographic eminence; and we regret that we have misunderstood him.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

We had intended to insert the interesting and useful communication from Mr. Hughes on glass houses and lighting, which has been lately read before the South London Society, but have postponed it to our next Number in order that it may appear intact, and that our readers may not experience the annoyance of being compelled to read it piecemeal.

F. R.—Alkaline development is quite applicable to the collodio-albumen process. Care should be taken to wash thoroughly between the application of different developers.

W. W. (*South Coast*).—1. Mr. Alfred Lloyd had such an establishment. 2. We have no doubt that Col. Stuart Wortley would allow you to take a photograph of the finest sea-water aquarium which was ever formed. The water will not materially obstruct the photographic action.

H. Watsey.—We cannot undertake to construct a formula from Major Russell's paper. A supplement to the paper is promised, which will probably contain details.

J. W. (*Plymouth*).—There are no secret formulæ for taking instantaneous pictures; a good lens, with bath and developer in perfect condition, is sufficient, with the assistance of a good light, to take pictures of breaking waves.

H. E. D.—The collodion which Major Russell uses is manufactured by himself. No doubt much depends on the good creamy film which is formed by the bromide. If you write to him, we are sure you will receive every information on your difficulties.

No. 159. JULY 15, 1865.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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NOTICE.

We are preparing for publication in the Journal a corrected list of the present Members of the Society, and which will appear in an early number. Any Member wishing for any alteration, addition, or change of address should express the same to the Society, care of the publishers.

◆

The Exhibition of the Society, at 9 Conduit-street, W., which has been an undoubted success, having been visited by a more uninterrupted succession than has occurred on any former occasion, was closed with the last month. Those exhibitors who have not had their works returned should at once apply to Mr. Henry Moody, the Curator, at the Gallery. We need hardly again remind our readers that all incidental expenses must be paid by the exhibitors.

◆

Dublin Exhibition.

Although we have no official information of the names of the Jurors appointed to make the awards in the photographic department of this Exhibition, we may inform our readers that Mr. Claudet, Mr. P. Le Neve Foster, and Dr. Diamond have consented to devote their services on the occasion.

◆

North-eastern London Exhibition.

The arrangements for the photographic department of this Exhibition, under the auspices of the North London Photographic Association, and under the immediate control of their council, are progressing most favourably. A large demand for space has been received by the Secretary, and it is anticipated that the contributions will fill the large south gallery of the Agricultural Hall. We understand that, amongst other advantages, exhibitors will be presented with a transferable season-ticket. Medals are offered for—

The most artistic picture or pictures exhibited.

The best portrait or portraits.

The best landscape or landscapes.

The best picture or pictures by a dry process.

The best enlargement.

The best lenses.

The best cameras and apparatus.

One Medal is reserved for any especially meritorious object which might be exhibited, but which is not provided for in the above list.

Testimonial to Mr. Shadbolt.

[We have the more pleasure in extracting the following article from the 'Photographic News,' inasmuch as such a testimony to the merits of Mr. Shadbolt by a rival journalist is creditable alike to the gentleman to whom it refers and to the gentleman by whom it is written.]

On Tuesday evening last a deputation of gentlemen met at the house of Mr. George Shadbolt for the purpose of presenting him with a testimonial of esteem and respect as a souvenir of his long public connexion with photography, which connexion the exacting pressure of his business duties had compelled him some months ago to bring to a close. Mr. Shadbolt had held a prominent position in the history of photography ever since the introduction of the collodion process. An active member of the Photographic Society, at one time sitting at its council-table, a ready and skilful debater, an ardent experimentalist, having a wide acquaintance with the physical sciences, and a cultivated gentleman, he rapidly took high rank among the representative votaries of the new art-science. About eight years ago he assumed the editorial charge of the then 'Liverpool Journal,' which under his care grew in influence and circulation, and in the course of time was enlarged, and issued as the 'British Journal of Photography,' which continued under his able management until last year, when, as we have said, the claims of more urgent duties compelled him to surrender all active interest in photography. For many years Mr. Shadbolt presided over the meetings of the North London Photographic Association, where his comprehensive knowledge of the art, tact, and general suavity contributed much to the success of the meetings.

It was with some of the gentlemen of this association that the idea originated of presenting to Mr. Shadbolt some recognition at parting of the esteem he had won in his long intercourse with them. A committee of gentlemen was formed, and steps taken to secure subscriptions. This was necessarily done privately, as publicity would have deprived the act of much of its grace. The privacy necessarily limited the number of contributions; but a handsome sum was nevertheless obtained, and embodied in a very beautiful silver epergne, the design consisting of a vine, the branches of which formed a candelabra, or held glass dishes for fruit or flowers. The massive effect of the whole, and the graceful ornamentation of the vine-leaves in chased work, was exceedingly good. On a shield at the base the following inscription was engraved:—"Presented to George Shadbolt, Esq., by a few photographic friends, on his retirement from public connexion with the art, 1865."

A deputation from the committee, comprising gentlemen associated with the Photographic Society, the North and South London Photographic Societies, and the Amateur Photographic Association, waited on Mr. Shadbolt, on Tuesday evening, to ask his acceptance of the testimonial. It was presented by Mr. Barnett, Secretary of the North London Society, with some brief but cordial and happily chosen remarks, and accepted by Mr. Shadbolt in a feeling speech, expressing his deep appreciation of the gift and the sentiment which suggested it, adding that it rarely happened that any one should be so rewarded for simply doing that which had most delighted him to do, so long as his own immediate duties permitted him, by any amount of effort, to give it his attention. The deputation, consisting of Messrs. Barnett, Hill, Shave, Foxlee, J. Trail Taylor, A. Melhuish, H. P. Robinson, and G. Wharton Simpson, after partaking of the graceful hospitality of Mrs. Shadbolt, retired.

Obituary.

On the 20th ult., at 2 Regent's Park Gardens, Thomas George Mackinlay, Esq., F.S.A., aged 56.

It is our painful duty to record the death of one who was not only an original member of our Society, but who produced the earliest presentable photographic portraits which were ever brought under our notice. Before Mr. Fox Talbot had published his "Pencil of Nature," we remember having had presented to us some of Mr. Mackinlay's early pictures, and at such an early date that, in an assembly of several highly educated persons, the general question asked was, what the productions were. A portrait of the elder Landseer, taken by Mr. Mackinlay, now in our possession, from a paper negative produced in the early days of the art, is of such great excellence as to favourably compare with many of the best productions of the present time, and, like many of the early pictures taken on paper prepared by amateurs themselves, it does not appear to have faded in the least, retaining a delicacy of delineation and agreeable tone of colour, making it a highly artistic production.

Mr. Mackinlay, although in business and the representative of the old firm of D'Almaine & Co., of Soho Square, devoted a considerable amount of time to scientific pursuits, and was possessed of means which enabled him to liberally gratify his refined tastes. Having acquired a lens and apparatus direct from Daguerre with which he could not obtain the success he expected, he was one of the earliest to ask the assistance of the late Mr. Andrew Ross, who afterwards obtained so much celebrity for the improved lenses which he calculated and manufactured. He was also one of the earliest to successfully practise the art of electrotyping; and his copies of the rare objects of art collected by Horace Walpole at Strawberry Hill, and sold by Mr. George Robins in April 1842, were reproduced by him, for his own collections, with a degree of excellence that has never been surpassed. Although not a constant visitor at our meetings, he was for many years a member of the Council, and took great interest in the welfare of the Society. To his suggestion is due the production of that handsome volume containing the Rules, and portraits of the members, of the Photographic Society Club, which held so many pleasant meetings under the immediate presidentship of the Lord Chief Baron.

Mr. Mackinlay was much indebted for the success of his chemical experiments to the late Andrew Ure, F.R.S., whose only daughter he married.

He enjoyed a large circle of friends, was universally beloved by all who knew him, and was a popular member of the various clubs emanating from the Society of Antiquaries and other learned Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A Council-Meeting of this Association was held the 23rd ult., at 12 York Place, Portman Square, James Glaisher, Esq., F.R.S., in the Chair. The Minutes of the last Meeting having been read and confirmed, the following Members and Subscribers were proposed and elected:—E. T. Castle, Esq., T. Letts, Esq., M. F. Proeschel (père), F. Moser, Esq., H. Cooper, Esq., jun., Miss C. Powell, H. V. Cholmondeley, Esq., W. H. Simpson, Esq., Capt. H. St. J. Dick, A. Impey, Esq., Wm. Sandy, Esq., E. H. Clarke, Esq., Lady Lavinia Dutton, G. A. Musgrave, Esq., F. R. Griffiths, Esq., W. B. Marshall, Esq., The Hon. A. L. Ruthven, Rev. W. B. Beaumont, W. S. T. Sinclair, Esq., Rev. Alfred Smith.

The Chairman then laid before the Meeting, for their consideration, a revised copy of the Rules, in conformity to a request which had been made to him at the preceding Meeting; and, after a lengthened discussion, such alterations and additions were made in the Rules as the Council considered suited to the growth and prosperity of the Association, the radical alterations made in the Rules being the withdrawal of the commercial elements from the Association, the doubling the amount to be bestowed each year in Prizes, and the withdrawal of Rule 10,—it being found by experience that the money received under this Rule would have been preferred in the shape of Prizes. The Secretary was directed to have the Rules, as revised, at once printed, and a copy sent to each Member.

A. J. Melhuish, *Hon. Sec.*

About Light, and about Lighting the Sitter; with some Reflections about the Room in which he is Lighted. By Jabez Hughes[*].

Light is verily the Alpha and the Omega of the photographer, yet it has received less special study than any of the agencies he employs. Hitherto our energies have been directed to the understanding and perfecting our processes—in securing good tools and proper materials; but having attained considerable success in these directions, it should now be our purpose to study how best to use the power we have obtained. We have conquered mechanics, controlled chemistry, subsidized optics, and now we should attack Old Sol himself, and seize him by the beams, as a lion by his beard, and so assume the mastery. Light is very much as the proverb says of Fire—a good servant, but a bad master. One must not let it have its own way; it must be governed, ruled, controlled, held in check. The Sun is far too liberal with his power; he darts his rays just as freely in the wrong as in the right direction, and is as ready to spoil as to make a picture. It is for the photographer to use and not abuse this prodigality. And this leads to the question of questions, how to use the light.

The subject is too great to treat in all its bearings, and I shall confine myself to portraiture.

To say, however, that the subject—the best method of lighting the sitter—has not received attention, is scarcely correct, for no one theme has been so much discussed for the last two or three years. It is a subject that seems in the minds of all. Now we have a communication in the metropolis, next it is from the provinces; this week it comes from Germany, last week from America, and so on. The constancy of the subject, as well as the many differently devised glass rooms, show that we have not mastered the subject, for we do not go on discussing that which we understand. I am afraid we are not likely to make the same rapid progress in this as in most other branches of photographic inquiry, purely from the intangible nature of the subject. In the mechanical, optical, and chemical branches, we have, by persevering experience, worked our photographic operations into a sort of groove; we have hedged them in with formulæ, and if a person of average ability only keeps within these boundaries, he is sure of moderate success. In mechanics, we have our plates and papers of certain sizes; in optics, our lenses of known diameters and lengths of focus; in chemistry, our solutions of definite strengths; all these are sufficiently universal and constant for daily use, so that we can compare our experiences. But when we come to speak of light, we are deficient in data. We cannot say, take forty square feet of glass in the roof, and the same number at the side, and place a sitter within six feet from these windows, and a certain result will be produced. There are a thousand modifying conditions to be considered—the aspect of the windows, the time of the day, the period of the year, the quality of the light; whether in town or country, on the ground or top of house, together with the numerous local peculiarities that every one has specially to battle with. From this it will be seen that the same fixed rules cannot be given for it as for other things.

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[*] Read April 13th, at the South London Photographic Society.

You may find a hundred photographers who may agree that Mr. Pyro's collodion is excellent, and that they are quite content with it; you may get scores of men to vow that 15 grains of protosulphite make a capital developer, and one which they use from year's end to year's end; but only ask them about "lighting the sitter," and you will find their ideas as various as the colour of their hair. And this diversity of idea will arise from two causes,—first, the absence of well-defined first principles of what constitutes a well-lighted picture; and secondly, from their ideas being bounded by the special influences under which they have had to work. Few photographers are enabled to build their glass rooms quite as they wish; there are often local conditions which they cannot control, and their constant struggle is how to make the best of what they have got. Now, any man who happens to have a room ill-placed for lighting, knows the vast amount of trouble and anxiety he has to endure before he masters it, and that at least a twelvemonth must elapse before he can understand what he can and what he cannot do in his room. When a man has honestly and seriously gone through this work, and eventually succeeded in producing good pictures at all seasons of the year, he must have acquired a deal of valuable experience. Unfortunately, most of this knowledge applies only to the local conditions under which it was acquired; for no sooner is this same man put in a differently situated room than he has to begin again, and pass through another series of trials to discover how to manage this new room. Only those who have encountered these troubles can fully appreciate the force of my remarks. Thus it is that the experiences of clever men get mixed up with matters of detail; they gradually acquire the knowledge, and they scarcely know how, and can rarely communicate it to a third party. When Etty was asked how he managed to produce his lovely flesh tints, he replied "He did not know, but he did it." If we ask Mr. T. R. Williams how he manages to produce those delicate half-tones, he will probably tell us "he don't know, but he does it."

There are no secrets now-a-days in photography; if I call on that celebrated artist Mr. C. De Vee, and, after looking at his beautiful productions, I ask, "Whose collodion do you use?" he answers quite frankly, "Oh, sometimes Mr. Ether's, and sometimes Mr. Alcohol's; occasionally I mix them." "What is the strength of your nitrate bath?" "About 30 grains." "Your developer?" "Iron, about 15 grains." "Your fixer?" "Hypo, always." "Thank you, much obliged. Oh, there's one more question I want to ask before I go, how do you manage your lighting?" "Ah, that's a different thing; I can't answer you. Come up stairs; you shall see my room, and I'll show you." (We ascend.) "You see this room is peculiar. I have a very troublesome light. On a dull day, like this, I work with the blinds as you now see them arranged; but when the sun comes out I have to draw down that blue blind and sometimes that black one; then I draw up this white one as far as I think necessary, and so I get very nice effects. But then it all depends, of course, on the sitter; I arrange the light different for a lady with a light dress to what I should a gentleman with a black coat. Again, it's quite different when I have a child to take and I want to work quick, to what it is when I have an old gentleman who is a good sitter." I leave my talented friend with the strong conviction that his beautiful effects are obtained by his skilful management of his light, combined with ordinary good photography; and that while he can readily give the proportion and particulars of his chemicals and apparatus, yet he is quite unable to give any formula for his management of the light.

Soon after that master of light and shadow, Rejlander, came to reside in London, I met him one day, and, as if the subject were pressing on his mind, he burst out with "People are constantly coming to me to see how I have fixed my light. Fix my light! I can't fix my light. They seem to think I have some patent way of arranging my windows and blinds, and that's the way I get my effects, and they want to see how it's done. I can't fix my light; the light is always changing, and I have to follow the light, and to arrange my model according to the light. Why, my light is never twice alike. Fix my light, indeed! Good day."

The subject is certainly more difficult than the consideration of chemicals and apparatus, and we shall be less likely to come to a satisfactory conclusion upon it; but shall we not therefore discuss it? For this reason we ought to consider it the more.

Before entering on the principal matter, let us ask ourselves a few questions with a view to getting simpler ideas of what we propose to discuss. "Lighting the sitter;" what do we mean by the phrase? Do we understand it in the artistic or in the photographic sense? It is important that this distinction be clearly drawn.

Lighting the sitter, "*photographically,*" means putting him into a much stronger light than usual, and keeping him there a sufficiently long time to effect a certain process. In the early days of the art it meant putting him for half an hour in the strong sunshine; now it means confining him for a short time in a sort of glass case. The *arrangement* and *management* of light, to the photographer, means the keeping it on the sitter and off the camera and lens, and also away from the plate during preparation and development. "Lighting the sitter," *to the artist*, means quite a different thing. It means putting him in a weaker light than usual, admitted through one window only, and allowed to fall in such a way that all the forms and contours of the individual are more markedly seen than in ordinary apartments. After the artist has arranged his sitter, and got the light so regulated as to show all the delicate shades, then it is to the purpose to inquire what he will do with it? He may paint, or draw, or model from it, or he may photograph.

The two classes, the artist and the photographer, are, in their essence, distinct, yet they may be, and often are, combined. The artist may be a painter, a sculptor, or a photographer; and the photographer may, or may not, be an artist. He may photograph things just as they happen to come, never altering or modifying; or he may, by art, so contrive that scarcely anything he does is not influenced and improved by this controlling influence. Happily, individuals of this class are becoming numerous, and to them the feeling constantly is, How are the great truths of art to be combined with the wondrous graphic power of photography?

To these persons the phrase "how to light the sitter" means, How are the advantages of the artist's studio and the photographic studio to be combined, and the disadvantages of each to be avoided? How shall we put light enough into the artist's studio to photograph the beautiful model without losing the half-tones, or how shall we introduce the proper modelling and delicacy into the photographic studio without losing rapidity and brilliancy? All the modernly devised glass rooms have more or less attempted to solve this problem. Not that I attach much faith to any form of glass room; the much more important inquiry is, how to use it? I think any one that visits glass rooms will soon come to the conclusion that no idea can be formed from the shape of the room what kind of picture will be taken in it. And the converse will equally apply; from the kind of picture you cannot infer the shape of the room. Most of us here are aware of the charmingly soft pictures of Mr. T. R. Williams, and also how near Mr. Blanchard's and Mr. Cooper's are to the same character, and yet their rooms are as utterly unlike as they can be, agreeing only in one thing, that they are all unfitted for what they produce. It would seem almost as if the light had made a challenge with these gentlemen and had defied them to produce good pictures in their rooms, and that they had accepted the challenge, had fought and won, and had made the light do just what they thought proper. One remarkable instance of what a man may do with a bad room was reported to me a while since. The artist in question had a very singular odd-shaped glass room built up among the chimney-pots, with windows in here and there wherever circumstances would permit; but the whole place was described as a sort of zigzag place, without form and void, and darkness was on the stairs that approached it. The artist rather piqued himself on its bizarre effect, and its apparent unfittedness for photographic work. He says he don't care for the form of the room, or where the light comes from; he forms on the instant just the light he wants by putting the sitter into a moveable box just large enough for one, and then he puts a sort of tent round, with very narrow blinds on each side, almost like wide ribbons; these he draws down one at a time until he gets such an effect of light and shade as he wishes. The pictures he produces I am assured are really of a very high order. From instances like these it would seem we might paraphrase Pope's couplet,

> "For forms of rooms let foolish photo's fight;
> His can't be wrong whose pictures are all right."

Although apparently any form of room can be worked in beneficially if only the artist knows how, yet I certainly think some are more easily managed than others. There is one form I detest, and yet it's the popular type—a huge glass box with perhaps some corrugated iron behind the background. Some authorities say, put as much glass in your room as you; can you don't know how it may be needed, and you can by blinds stop out what you don't want. I would rather say, put in as little as you need; for until you try, you don't know what a quantity you can spare. Where there is so much glass, there is a tendency to use it, "What's the use of having glass and not using it?" The curious thing is that, beyond a certain small area, all the rest of the glass in the room, not only does no good, but a deal of harm, in causing flatness and fog; and, more singular, though there 's so much light in the room, the exposure in the camera is not shortened. Let any man who uses a deal of glass window close up by degrees all the distant panes from the sitter, and he will be surprised how many he may stop up with advantage and without any loss whatever.

An *artist's* studio is a chamber artificially prepared so that all the half-tones and delicate shadows of the face may be seen more perfectly than in an ordinary room. And why are the shadows less seen in an ordinary room? Because the increased amount of diffused light obliterates them. If this is true in our usual rooms, what becomes of those delicate tones in one of these huge glass cages? Why, they are destroyed on every side, and nothing is left but the hard, abrupt shadows, and the broad, flat, high lights. Some years ago there was a cry raised against white paper skies in landscapes; who will get up an agitation against white paper faces and black shadows? Surely these are quite as unnatural, and more repulsive.

I think the so-called glass room should be looked upon as a piece of apparatus for putting the sitter into—a sort of camera—and the apertures in the sides and roof should be made more after the idea of the artist's studio—that is, not to light the room, but to light the sitter. These apertures or windows (I prefer just now to call them apertures) should be made no larger than is necessary to produce the effect. Every sensible photographer is jealous of each ray of light that enters the camera that does not produce a picture, and so should he be of every ray that enters his illuminating room that plays no part in illuminating the figure. I have called the glass room, for distinction's sake, the illuminating room, and I like the term. It may or may not be a *glass* room; I know of many that have very little glass in them. The glass is a mere accident; it is not the glass that admits the light, it is the aperture in the wall or roof that admits the light, and the glass is merely used to keep off wind and weather. It is these holes or apertures that have to be so arranged as to allow the light completely, but gently and softly, to illuminate the object. This should be solely the purpose of the room.

As it is an admitted photographic maxim that we cannot get a brilliant print except from a good negative, so it may be equally affirmed that we cannot get a good negative except from good lighting. A well-lighted picture is one where the light falls chiefly in one direction, so as to form well-defined shadows. Then a secondary light should be admitted, just strong enough to light the shadows, so that they shall not appear too hard and abrupt, but delicate and soft. If the secondary light does not do this, it is not strong enough, and the picture will have too much contrast. Discussion has taken place as to whether the chief light should come from the front, the side, or the top of the sitter. I think wherever the light comes from *one* distinct direction, it is bad, as the shadows produced will be too decided (I am speaking of lighting the sitter's head). I think the principal light should come in such an oblique direction as to be partly from the top, partly from the side, and partly in advance of the sitter. I think the secondary lights should be almost the reverse, so that the two sets of lights should be in opposition. I think there should be a gentle struggle between the two for the mastery, but one must always predominate and govern, not rudely and violently, but gently and sweetly. Shall we be poetical and say the principal light must be masculine and vigorous, and the secondary one be soft and feminine, so that the effect of the union is such a happy blending of light and shadows with a myriad of connecting half-tones, that you cannot tell where one ends and the other begins, but where each is present to strengthen and beautify the other, like two souls wedded in perfect harmony?

I think the true test of good lighting is the preservation of delicacy of half-tone. Ruskin says that he can only find one thing common to all great artists—delicacy. May we not say the same of our clever photographers? Consider the works of Bedford, Robinson, Williams, England, Wilson, Blanchard, Mudd, Heath, Thurston Thompson, and the many others equally skilful; and in what do they excel so much as in their wondrous delicacy? And what is delicacy but another name for soft and tender half-tone? Remember, there is quite as much beautiful and delicate half-tone in the deepest shades as in the highest lights, and all is produced by a harmony of opposing lights. The first condition, however, is for a person to feel and love these delicate gradations, to be happy when they are present, and miserable when they are absent. When this condition of mind is produced, the quick hand and sensitive eye will find means to register them on the plate.

The grand claim of photography is, *that it is true*. Deprive it of this virtue, and all its other merits are valueless.

But the presence or absence of half-tone is the principal element of photographic truth. It is not usually thought so, but it's a fact. Let us take an instance. Two men put up a round wooden ball to photograph: one turns on his indiscriminate blaze of light, and so produces a *flat* picture from the *round* ball, just as if it had been a wooden plate; the other so arranges his illumination, so lights his figure, that the round ball looks like what it is, and in the photograph it seems to almost stand off the paper. Both these are photographs from the same object; yet one is true, and the other false; and the truthfulness of the one consists in carefully registering all the gradations of the half-tones that represent the rotundity of the ball; and the falseness of the other consists in the omission of these half-tones, so that it represents a flat plane. The human head is nearly round; let us suppose that, instead of a wooden ball, it was a head these two men took to delineate, do you mean to say that the man who lost the likeness in the ball would not also lose the likeness in the head? And if the other, by careful management of light and shade, most perfectly produced the likeness of the ball, would he not as surely secure the likeness of the head too? Is there not here a clue to why some persons take better likenesses than others? May not some of us take a hint and practise on the wooden heads?

How to light the sitter! the inquiry still crops up. It is certain we have gone on long enough lighting the sitter from the photographic point of view—that is, blazing away from large skylights till almost blinding him, but, as a rule, we have not produced satisfactory pictures. Let the endeavour rather turn in the other direction. Let the artist's studio be the model; but as that is only the other extreme, suppose a compromise be made, the idea being that the studio of the photographer furnishes the light, the other the delicate half-tones.

Some persons make it a rule to examine the image carefully on the ground glass, and never to take a picture until it is seen satisfactorily there. This is a good plan when judging of the sharpness of the focus, the size of the picture, and the presence of the proper amount of accessories, &c. But on the ground glass is not the best place to see the amount of light and shade to be represented on the sitter. The late Mr. Lacy accurately expressed the idea when he said, "I arrange the light and shade on my sitter just as I wish it to appear in the finished photograph, and I never proceed with a negative until I have satisfied myself on this point. I look at the sitter's head, and I watch the effects as I change the lighting, and when I have the best arrangement I take the photograph; I expect the lens to give me just what I see with my own eyes." In this, no doubt, is contained the true idea. The lens is a blind instrument; it will delineate what is presented before it, and the photographer is responsible for its work.

"As the sitter's lighted, so 's the picture drawn."

Some people have an idea that the collodion should give the modelling; this is wrong. Collodion cannot give what it has not got. Collodion, good collodion, can register the modelling if it is in the sitter; but if it is not there, how can it? A Scotch minister once reproved a parishioner for going to sleep during the sermon. "Man," says he, "could you no tak' a pinch of snuff to keep you awake?" The reply was, "Minister, could you no put the snuff in the sermon?" Depend upon it, if we rely on the collodion, or on any of the chemicals, for the modelling, we are looking for the snuff in the wrong place.

In another part of this essay I have spoken slightingly of the *form* of the "illuminating room." I wish to be understood on this point. Though Mr. Williams, Mr. Blanchard, and Mr. Cooper take charming pictures in their ill-arranged rooms, yet it is certainly not in consequence but in spite of their disadvantages, and they all agree in deploring their existence. Any room with mainly a south aspect must afford much more trouble than one looking north, and much valuable time will be saved if the natural arrangements are in harmony instead of being in opposition to the artist's wants. Although a true artist can dispense with accidental aids, it should never be beneath his notice to seize them when he can. It occasionally occurs that a room by a happy accident may suit to produce such charming effects that even a mechanical photographer may turn out really artistic pictures. I have a case in point. Some time since, a very distinguished London photographer asked me if I knew Mr. Blank, who lived in Dashtown. I said I had heard of him. Did I know the character of his pictures? I did not. "Well," said my friend, "a lady brought me a picture to show; it was one of the most lovely things I had ever seen; such brilliancy, such modelling, and such delicate tones! The picture haunted me, and I was not easy till I went some two hundred miles to see and talk with this man. I saw scores of his pictures as good as the one I first saw: I talked to the man, and, to my astonishment, he was as ignorant as a pig. He let me see his glass room, and the whole thing was explained. The room was a brick building, with a large window on one side, extending partly up the roof. The aspect was a clear uninterrupted north one, and therefore, from one year's end to the other, he worked without trouble or inconvenience, producing these lovely things. The one main light came on the sitter, and the light sides of the room reflected gentle streams of light that softened the pure and brilliant shadows." Such was the explanation given me of the cause of these beautiful pictures. It appears this person knew his pictures were good, and took credit for them; but a proof was afterwards given that he really knew nothing of the cause of his success. He had occasion to build for himself a glass room in another town, and he erected a large barn of a place with glass all over, and took as bad pictures as any sixpenny man who works in the open air. The amusing part was the bewilderment of the man why his pictures were not as good in the one room as in the other.

I am happy to bear witness to an excellently devised glass room built by Mr. Stuart, of Glasgow, at Helensburgh. It has a clear uninterrupted northern aspect, on which the sun never shines; there is not a blind or screen of any kind in it, and the pictures produced are really models of good lighting. Its goodness consists, like the person's whom I have called Mr. Blank, in its being happily placed before a clear north light, and the sides of the room act as reflecting screens to modify and soften the shadows. The building of this room in this way is not an accident; it is the result of much experience and reflection, and it was constructed to do what it has perfectly accomplished, and is as creditable to this gentleman's sound theory as it is satisfactory in his daily practice.

About lighting the sitter! so much has been said and written about lighting the sitter, and so much has been done in the way of lighting him, that it is time we changed the subject and began to think about *shading* him. I think, if anything, he has been over-lighted; I am sure he will be very thankful if we can furnish him with gentle shadow, and he will be eternally obliged if we can relieve him from the horrors of the glass room. Fortunately, a sitter is not such a rarity that we need put him in a glass case. The very term *glass* room encourages the idea that an indiscriminate amount of light should envelope the sitter. It has been sufficiently established, that a room mainly built of glass is not only not needed to take portraits in, but that it is one of the worst rooms for the purpose. It is hot in summer, cold in winter, wet in rainy weather, and dirty all the year round. That those "who live in glass houses shouldn't throw stones" is right enough; but I don't live in a glass house, and I don't believe in a glass house being a photographic necessity, and I think the sooner the notion is dispelled the better for the art and its practitioners. Therefore I throw stones (brickbats and slates I should prefer), and I hope I shall break many of the panes in the conventional glass room and get them replaced by these more fitting materials. It is sufficient that there be reasonably large windows by the side and over the head of the sitter, and all the rest of the room should be in literal darkness. A room constructed on this plan differs but little from an ordinary artist's studio, and is the best adapted for securing the greatest amount of useful light without losing half-tone and modelling. The windows should, if possible, look to the north, and should be so surrounded that neither the morning nor afternoon sun should shine in. If all these advantages cannot be secured, the nearest approach to them possible should be attempted, and each person, so far as his local circumstances will permit, should avail himself of the general principles.

It is curious that many photographers have an aversion to discussing this subject—the best mode of lighting the sitter—viewing it as foreign to photography, and as generally ending in a eulogium on art, fine art, high art, the arts generally, with a back-handed blow at photography as the dirty Cinderella of the arts. I fancy I hear such a one saying—"Ah, I had an artist come to me one day with a sitter, and he would arrange the light and pose; and of all the abominations you ever saw, that was one of the worst. I hate artists," he continues, "they give themselves such airs, and pretend to know such a lot, and all the while they know nothing at all about it."

I admit that artists do sometimes give themselves more consequence than their knowledge of photography warrants; but this can be no reason for the photographer displaying equal illiberality by turning up his nose at art.

But the question is many-sided, and perhaps enough was said about it, from the artist's stand-point, at an earlier period. Let us walk round our subject, and look at it from another point of view; let us see if, judged by the light of common sense, some hints for improvement may not be gained from every-day experience.

What is the verdict of the world as to phographic portraits? "That they are never flattering, seldom favourable, and rarely pleasing." (Of course *we* think different, but that 's by the way.) Suppose we ask the public why they put this harsh interpretation on our labours; the answer will be, "that we exaggerate their blemishes, decrease their beauties, and always make them look older."

Of course *we* know this is all wrong; but let us suppose, for argument's sake, that there's some truth in it, and suppose we humour the public by debating the point. Let us suppose some of us professionals are in our reception room, an ordinary well-lighted apartment, where our specimens are râther tastefully displayed. In comes a middle-aged, intelligent gentleman—he sat for his carte-de-visite only last week—and, after the usual salutations, we plunge into the subject on our mind. "Now, sir, do you join in this general outcry that is being raised as to the unsatisfactory nature of photographic portraiture?"

Mr. Public rejoins, "Well, I think there's some truth in it."

"Some truth in what? photographic portraiture, or the outcry against it?" we ask.

"The outcry against it, of course."

(This was not the answer we expected, but never mind, we'll question him a little more.) "Well, as we know you are not a person to hold an opinion without having a reason to support it, perhaps you will kindly tell us why you think our portraits so unsatisfactory. It's quite a new idea, I assure you."

"I don't allude to yours in particular," is the reply; "my remarks apply to the whole fraternity. My principal objection to a photographic portrait is, that it is not a true and natural one."

"Not true and natural!!"

"Allow me to explain. I complain that you photographers have adopted an artificial method of representing people. You always put a black patch under the nose; I see it in all your specimens here, and it's the same everywhere else. Then there's always one side of the face very white, and the other very dark."

"Oh, that's the shade, the shade; ask any artist ——"

"I am not an artist, and I know nothing about art, but I am only explaining why I and others object to your portraits. Remember you began the discussion, and I am only trying to answer your question."

"Beg pardon, I'm sure; pray go on, highly delighted. Quite interesting, I assure you."

"Well, I was about observing that I do not see the necessity that people should always be represented with a black patch under the nose, this dark side to the face, the black shadow under the eyebrow, the semicircular black lines under the eyes, the patch of white on the top of the hair, the ——"

"But you forget that unless these shadows were there we could not take your portrait at all."

"That's what I expected you would say; and it confirms my remark, that your portraits, therefore, are neither true nor natural."

"But ——" (We are getting quite hot now.)

"Excuse me, I've not done. I saw a portrait of you here just now; here it is. Come nearer the window; I am looking now at just the same view that the portrait shows, and I wish to compare your appearance as I see it in fact, and as it is represented in your photograph: I will begin at the top. Your black hair is very fairly shown, only there are two or three large patches of white that I don't understand, and don't see the necessity to be there; I'll pass to the forehead. Your own, as I look at it now, seems to be round, with some phrenological bumps; but in the photograph it is quite flat, and no bumps, unless that black mark is to represent one, though it looks more like a bruise. Your eyes seem very well done."

"I am glad you found something to be pleased with."

"Oh, yes, the eyes are very fair; they are hazel in nature, but you have them here as jet black; but, perhaps, that's near enough. I suspect if they had been blue or grey they would have looked as if you were blind. But why is that black patch under your brow? I declare it's blacker than your eyebrow itself. Then your nose! It certainly is not the same shape here that it is in nature; besides, that abominable snuffy patch under it, just the shape of a little cocked hat. Your whiskers appear to me both the same in colour and shape; but in the photograph one is grey, and the other—well I can't see the other, for it and the black side of the cheek are so mixed up, that they look like a bit of black sticking-plaster, and the stray hairs look like the ragged ends."

"Oh! I can't stand this any longer," we now exclaim. "It's perfectly absurd. You forget that I stood in quite a different light when that portrait was taken, and you are condemning it because it's not like me when I stand in *this* light. Why you must think I am an idiot to stand and hear you go on like that. I don't want to get out of temper, but just come upstairs to my glass room, and I'll prove to you what nonsense you have been talking." (We go upstairs.) "Now, sir, this was where I stood when that portrait was taken, and it is supposed to represent me when I stood so, in this light. Now look at me, and then look at the portrait, and see if you don't recognize all the markings, the lights and shades—the everything, such as it is there." (I was getting downright warm, and I thought it was high time I should speak out.)

"Well, I must confess you are right. As you stand there, the portrait certainly does wonderfully resemble you."

"Of course it does. You see people shouldn't talk about what they don't understand." (He had been walking into me pretty strong, and I thought I'd let him have a bit of my mind.)

"I did not finish what I was saying. I acknowledge that the portrait does resemble you up *here* a great deal better than it did down *there*; but as I had always seen you down stairs, I naturally would prefer to see your portrait as you look there. Allow me to say that I don't know the reason why you insist on coming up here and putting yourself in that violent light. It certainly don't improve you, for if I saw one wrinkle in your face down stairs I see twenty up here. In this place you look anxious and haggard, and certainly ten years older."

"But you must consider ——"

"Allow me to continue: I made the remark just now that photographic portraits struck me as being neither natural nor true, and you seemed startled."

"I should think so indeed!!"

"I think I now see the reason. Your portraits are not true and natural, because you do not represent people as they see each other; but you bring them up here and place them in this strong light. They wink and blink their eyes, and have all sorts of markings and shadows on their faces that are only seen when they are up here, and which, by the way, never seem to improve them; and while in this artificial condition you insist on taking their portraits. I can see the reason now why my friends are so dissatisfied with *my* portrait, and why I look so old and disagreeable."

"But, Sir, just listen ——"

"Excuse me, I will look in on another occasion and hear your reply; but now I must bid you good day. But before I go, let me say that so long as you gentlemen find it necessary to put people in such a dreadful light as to make them look older and more ugly than they naturally are, depend on it they will not visit you any oftener than they can avoid, and will begrudge the money they pay you. But if you can only make them at least as good-looking, and as pleasant-looking, *and* as young as they really are, your business will be a more prosperous one. This, it strikes me, you will never be able to do until you abolish that strongly lighted room. If you could only take your portraits in such an apartment as people are in the habit of seeing each other, and when the lights and the shadows are the same as they are daily seen, and where the appearance and expression of folks are of their usual pleasant and cheerful character, then, and not till then, will your portraits be quite true and entirely natural. But, excuse me, perhaps I am wrong; you gentlemen ought to know best. At any rate I must go now. Good day."

"Good day, good day, Sir. What an original to be sure! Very singular ideas! It strikes me the old gentleman got rather the better of me in the argument. I'll think over what he said. I think he's more than half right. Just struck me! I know what's wrong. Too much top light! Too much front light! Too much light altogether!!"

From the above fancy sketch it will be seen that, even by the homely test of every-day experience, to say nothing of the voice of ART, the ordinary method of "lighting the sitter" by turning on the usual glass-room blaze is as unsatisfactory in practice as it is indefensible in principle.

That some good will arise from the discussion of this subject is the earnest wish of those who love photographic portraiture, and wish to see it stand higher in public esteem.

[At the last Meeting of the Photographic Society, Mr. Heisch, the now representative of the former firm of Murray and Heath, exhibited a most complete box tent, the following notice of which will be acceptable information to those requiring a truly useful tent. We must offer an apology that Mr. Heisch's name was entirely omitted in our last issue.]

The Landscape-Photographer's Manipulating Box Tent.

THE points aimed at in the construction of this apparatus have been principally these:—

1. That everything required for photography in the field should be contained in one package of convenient size and shape.
2. That everything should travel as much as possible in the position it will occupy when the photographer is at work. This enables the operator to see at a glance before starting that he has everything he requires, as, each article having its own place, an empty space shows at once what is absent.
3. That the whole should be perfectly steady.
4. That all white light should be perfectly and easily excluded.
5. That there should be abundance of yellow non-actinic light and perfect ventilation.

These objects are attained in the following way:—

1. Everything except the tripod-stand travels inside the tent, which, when shut up, is a box measuring only 34 inches long, 12 inches wide, and 27 inches deep, for plates 12 × 10 inches.
2. All articles required for use in the tent, with the exception of the bath, are fitted into compartments in the most convenient place for use. Thus the bottles are on divided shelves in the upper part of the back of the box immediately over the sink, just opposite the eyes of the operator, and are retained in their places, when travelling, by a padded board which fits in front. The principle of having a place for everything is carried to its utmost limit, as

there is even a separate place provided for every stopper when it is out of its bottle; so that if the operator will put everything in its place, nothing will be lying loose on the table. Developing-cups, pneumatic holder, plate-rubber, &c., are all fitted on the same principle. The bath, in travelling, packs under the shelves holding the bottles; when in use, it goes through the table into a bag, and rests diagonally across one corner of the table. A hook is provided for holding the dipper above the bath, so that both hands may be at liberty to place on or remove the plate, thus preventing the necessity of injuring the film by taking hold of the corner. A sink with an elastic pipe, and water-vessels of various sizes, with elastic tube and spring cock, are provided.

Steadiness is attained by the use of a tripod with a large circular top, giving a base much larger than usual. The table is formed partly of the bottom of the box and partly of the front, which is divided, the lower part being hinged, to turn down for the purpose. The other portion of the front is hinged upwards, and forms, with the top of the box, a complete sloping wooden roof to the tent.

White light is perfectly and easily excluded by turning up a portion of the cover attached to the front of the table, and looping it round the neck, after the manner of the bib of an apron (this also serves to prevent staining the shirt-front), while two strings attached to the other portions of the cover are tied round the waist. Light and ventilation are secured by two sliding windows, one in the front, over the sink, and the other in the roof of the tent, over the head of the operator. These are covered with the orange adiactinic silk; and when open, a perfect draught is established through the tent.

A combined plate- and draining-box, holding ten clean plates and draining eight negatives, in perfectly separate compartments, completes the apparatus.

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Major Russell and the Photographic Society.

To the Editor of the Photographic Journal.

Sir,—I beg to state that I am one of the persons to whose correspondence Mr. Glaisher referred at the last meeting of the Photographic Society, and I shall feel obliged by your publishing my account of the matter, as far as I am concerned. I had nothing whatever to do with the things spoken of in the beginning of your first leading article (15th June). Before the meeting last May, I never made any representation to Mr. Glaisher, nor was I aware that any was made. So little have I troubled myself about the management of the Society and its Journal, that I do not know the names of the members of the council or of the committee.

On the appearance of the Journal on the 15th May, I observed an article in it which I considered injurious to myself, and which I believed to be written by Mr. Simpson. Other things in the same number seemed to me to show traces of this gentleman's management. I wrote to Mr. Glaisher, stating my opinions, which were based entirely on my own view of the internal evidence; not on information derived from any one. Indeed, I communicated with no one between reading the Journal and writing. I was not aware till afterwards that any other person had written to Mr. Glaisher on the subject. I am, therefore, not responsible for what any one else may have said, nor is any one but myself responsible for my opinions. I say nothing either way about Mr. Glaisher's other correspondents. Indeed, I do not know enough to be able to do so. It may be asked why I particularly objected to the article as coming from Mr. Simpson. It was because he knew that I practised my plan of alkaline development before the publication of Mr. Leahy's method, and because the article appeared in the Photographic Journal. After some correspondence, Mr. Glaisher put me in communication with you, about the end of May; and thinking that you had in some way been deceived, I was glad of the opportunity of telling you what I thought, which I did plainly, and gave my reasons pretty fully. I had no object beyond calling attention to what I thought wrong. It seems to be insinuated that I was actuated by bad feeling towards you. You know, Sir, that any such insinuation is unfounded.

More than once in my letters to Mr. Glaisher I told him that he might make any use he pleased of my communications, and left it to him to mention my name or not; and said that I had no objection, as far as I was concerned, to state my opinions anywhere. I repeated this to him in your presence, just before the last meeting. Had I come forward on that occasion, I must have stated the grounds on which I went; and I thought that this course might have a damaging effect on others. Out of consideration for them, therefore, and to avoid the risk of adding fuel to the fire of party spirit, which I had much rather see quenched, I forbore to say anything till I should be called on to do so. I have now to thank some writers for putting things in such a shape that I can and must without scruple bring forward publicly matters which well deserve the consideration of every member of the Society, and which I think deeply concern its welfare.

It appears that I was mistaken in supposing that Mr. Simpson wrote the article himself; and I therefore beg to apologise to him for saying that I thought he did. In my correspondence with you I said I was glad to hear that he was not the writer; I shall be still more glad to find that he is free from all complicity in the matter.

The day after the meeting (14th June), I wrote to Mr. Glaisher, explaining more freely than before the grounds on which my opinions had been founded. The following extracts will show the most tangible points:—"In the first leading article" (Photographic Journal, 15th May) "appears the same mistaken idea which also appeared near the same time in the Photographic News" (19th May), "viz., that Mr. Wardley's method of developing is the same in principle as mine. The sentence to which I alluded before is the last in the article. It may seem rather ungracious in me to use in this way a passage in which I am complimented; but, after the attack on me in the same article, I did not feel much obliged to the writer. To save you the trouble of referring, I will copy the parallel passages. Photographic Journal, No. 157, p. 54:—'Photographers are much indebted to men like Major Russell, who for years follow out with patience and assiduity certain experiments, devoting their whole energy and time to the elucidation of some one important point or process, and then freely and without reservation presenting the results to the public as a contribution to the general stock of knowledge.' Photographic News, vol. vi. p. 2:—'Photographers are highly indebted to such men as Major Russell, who, with the ability, leisure, and means necessary, steadily apply themselves, month after month, without weariness or impatience, working out definite results by careful experiment, and then unhesitatingly laying them before the public for the benefit of photographers at large.' When I first spoke of these passages, I did so from memory; . . . I think there is a strong case for supposing them to be written by the same person. . . . I had no doubt whatever that Mr. Simpson was the writer; it was, I confess, rash to say so, for I did not *know* whether Mr. Simpson wrote his own articles. . . . . I know nothing of the merits of the quarrel treated of in the second leader, so will only say that the tone is such that I was sorry to see it in the Journal, and that the way in which the cudgels are taken up on behalf of 'our contemporary' seemed to me suggestive, when taken with other things. As I told you before, the reports of the meeting in the two Journals seemed to me essentially the same; for instance, the same mistake in giving what I said about 'piling up' appears in both; but the 'News' has a practical hint of some importance, which is left out in the Journal (see my letter to the Journal, 15th inst.). Perhaps, what looks worst of all occurs in the notice of Mr. Ross's pictures. Now Mr. Ross and Mr. Dallmeyer are both first-rate opticians . . . . but the report in the 'News' cuts your remarks down to the smallest dimensions, and in the Society's Journal they are altogether suppressed. . . . I am also sorry that I cannot apologize without feeling that there are other ways of putting forward one's ideas besides writing them with one's own hands. I cannot feel quite satisfied in the face of very strong internal evidence without knowing a good deal that I have neither the right nor the inclination to ask; so perhaps the best way will be . . . . and in my own mind do my best to acquit the gentleman in question of having originated certain ideas. These are, I still honestly believe, those of the 'News'; but they may possibly not be those of the editor, and he may at any rate not have been accessary to their appearance in the Journal of the Society."

It is not worth while to say much about the strong language which has been used on the subject; it speaks for itself. Not only do I feel that it is quite inapplicable to anything I have said or done, but I hope that it would not have been used had the writers known the true state of the case. Silence might, however, be misinterpreted; it might be thought to show that something in my letters to Mr. Glaisher had laid me open to some of the pleasant epithets which have been thrown at me. The whole of these letters would be too long for publication, and extracts might be thought to give an unfair impression; I will therefore call Mr. Glaisher as a witness, and give a few sentences from his answer to my letter just quoted from. ". . . If you alone had written to me, I certainly should only have written to you: I believe that your object is precisely the same as mine—to find out the truth. I never see the 'Photographic News;' I have not seen half a dozen copies altogether. I had not seen the like passage, nor was I aware of the similarity of the reports of the meeting in the two journals." . . . "I believe you have good grounds for all you have said. It is likely that, similarly circumstanced with yourself, I should have said the same. All your correspondence is open and gentlemanly, and none marked private." . . . . "but I honestly declare that I cannot find any undue influence at work."

The affair about Mr. Ross has been explained in the Journal (15th June); but the explanation is only so far satisfactory that it shows the omission to have been accidental as far as *you* were concerned. Now it required no statement to convince me of this, so in my opinion it is no explanation at all. This very lame account is immediately followed by an article which seems to say to the 'British Journal,' "You're another." Well, if so, this is no justification.

I have asked no questions, and I do not ask any now; but perhaps I may be allowed to suggest that a little explanation might be quite as much to the purpose as hard words, which are a pretty sure sign of a bad cause. Really the tone and language of some gentlemen are exactly what might be expected, if my notions are well-founded, from a faction exulting, perhaps rather prematurely, that an attempt to expose their practices had broken down. People accused of anything do not commonly forget themselves so far, unless there is an unpleasant amount of truth in the accusation. The tone of some things in the last number of the Journal contrasts remarkably with the fair, gentlemanlike, and kindly spirit shown in your correspondence with me, already alluded to. This contrast, and the appearance in the Journal of imputations which you knew were unfounded, afford fresh proof that something very wrong is going on. It seems that the ostensible Editor has little or no influence in the management of the Journal, which appears to me to have fallen into most improper hands. I am not uncharitable enough to suppose any other explanation to be possible.

What I wish to lay before the Members of the Society, putting it in a form as little personal as possible, is this:—I honestly believe that there has been some connexion between our Journal and another; and I do not think it conducive to the good quality of ours that persons should be connected with it who may have a greater interest in another. A much worse result is, that in this way a party appear to have had the means of making our Journal their mouthpiece, and using it for their own purposes, as it seems to me, with less moderation and sense of responsibility than in their own organ. I think that every impartial and attentive reader of both Journals must have observed this. Unfortunately, an acrimonious spirit prevails among photographic journals generally, and I am sorry to say that ours is no exception; indeed I think that of late it has been the worst in this way. Surely this is not creditable to the "parent Society." The last sentence in the last Journal does not concern me; but, whatever the provocation, the spirit of it is such that comment is unnecessary.

I have no personal feeling against those who write so bitterly; indeed, I do not know who they are, and make no objection to their showing their likes, and dislikes, and party spirit in a journal of their own; but, as a Member of the Society, most decidedly object to their using, or rather abusing, our Journal for such purposes. I do not greatly blame the party-men; no doubt they think their ideas quite right and creditable to any journal: the independent Members are quite as much in fault to allow such practices. I am convinced that, unless bitterness and party-spirit can be got rid of, the Society, which has suffered greatly from these things, can neither be prosperous nor useful: independent men will not support it. The Members in general may perhaps think that I am under a delusion, or, admitting it to be as I suppose, may approve of this state of things. However this may be, I have done what I think right in putting my opinions plainly before them. C. RUSSELL.

P.S.—I have received a letter from Mr. Glaisher, in which he expresses a wish that the following passage from his letter already quoted from should be published:—"I am of no party or clique; I see none in the Council, and do not think there is any in the great body of Members." I did not think of quoting this passage, the first part because I was not aware that any one had accused Mr. Glaisher of anything of the sort, the latter part because the last of my former quotations from his letter conveyed the same meaning to my mind.

Mr. Glaisher speaks to me of another matter, which I will now explain. In my first letter to him after the May meeting, I mentioned a statement which I had heard from another person; this was made to me before the appearance of the Journal, and I received it about the same time. The statement was about a different matter from those which I complained about; and my opinions were not based upon it, but were formed on the grounds which I have stated. I expressly said that I was not responsible for the statement in question, and I did not know, nor do I now, whether it was correct. I did not mention this matter, because it is quite irrelevant to what I have said; and I do not say more about the statement in question, because it was made in a private letter to me, and I have not asked for permission to publish. C. R.

[We regret that Major Russell has thought it needful to request publication of the above. It is again reviving a subject on which our readers, we had hoped, had felt satisfied, as having been fully discussed and disposed of. The writer will not accept our explanations, written fairly and candidly to himself; and it compels us, in self-defence, to make the following brief statement. After the reading of the lengthened communication at the May Meeting of the Society, a very short public discussion took place. It might have been from the desultory way in which the author read his paper, or from the vastness of the subjects treated of, that there was this failure.

When the Meeting adjourned, the Members conversed with each other more freely, and certain questions, as to how much of the knowledge was original, were asked, which made an exact reference to what had already been written on the subject needful. We had tried the instantaneous plates of Dr. Hill Norris with perfect success, and the plates as lately recommended by Mr. Hughes with equally good results. We had also noticed blurring in paper negatives, and therefore, without still further inquiry, must withhold our assent to the writer's doctrine on that subject. We found that Mr. Leahy of Dublin had, on October 23rd, *published* his alkaline development, and in November the Major published his independent discovery. We fully believed it to be an *independent* discovery; but Mr. Leahy was certainly the *first* to publish, and why should his name be altogether ignored?

We had not the honour of any knowledge of Major Russell whatever, and the intended complimentary passages were adopted from the recorded opinion of the editor of the 'Photographic News,' whose opinions we value with reliance. The re-assertion that the editor of the 'News' has, by his agency, caused insertion of matter in the Society's Journal, which he was ashamed to insert in his own, is perfectly unwarrantable. Mr. Simpson has publicly denied the fact; and our also so doing has been without that "*mental reservation*" which is intended to be insinuated. "*Qui facit per alium, facit per se,*" is accepted in its true sense by all right-thinking men. Even if things were as the writer suggests, we have yet to learn that we are not at liberty to avail ourselves of the knowledge and experience of our friends. Of "cliques" we know nothing; and the accusation of unworthily neglecting one to extol the productions of another is utterly untrue, and needs no refutation. Whatever may be our editorial failings, we have always endeavoured to avoid personalities; and we beg to assure Major Russell that at present we do not claim the virtue of "resignation."—Ed.]

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To the Editor of the Photographic Journal.

Sir,—Having learnt that Major Russell's communication is to appear *in extenso*, a copy of which he forwarded to me a few days since, may I ask you to publish the following letter, which I sent to Major Russell on returning to him his MS., in the same number of the Journal in which his communication will appear?

Yours, &c.,
James Glaisher.

Blackheath, July 10th, 1865.

My dear Sir,—I feel sorry that you consider it necessary to write so long a letter, and I regret its tone. It can do no good, however; the Editor will have to think over it.

I am sorry that my assurances, the result of my convictions after most rigorous inquiries, should be so little valued by you. I am sorry that my repeated assertions, that I know of no party in the Society, have been passed by you without notice, and your assertions again about party reproduced in the letter.

With respect to extracts from my letters to you, they may be all published; but when you speak of party, as you have given extracts from my letters, I think that you ought to say that I have also said to you in my letters, "I am of no party or clique; I see none in the Council, and I do not think there is any in the great body of members."

I shall make no further remark upon your communication than again regretting its tone; at the same time, if this letter appears as it is, I shall be compelled to tell the whole truth, and to point out, that before you wrote to me you had written to another gentleman, and had had a reply from him, which was the cause of your writing to me at all upon the subject.

This reply is the corner-stone, the foundation upon which the whole correspondence is based.

Again, yours was the first letter of this correspondence addressed to me; and the rest to which I referred, or very nearly all, sprung from it.

I cannot think it proper to write upon parts of the correspondence only; and although I have said to you, in answer to your asking my advice, that your name having been mentioned, and feeling that you might well announce yourself as one of the three parties, giving briefly your reasons, *beginning, however, at the beginning*, I said I felt that you had better write and give those reasons.

I hope the Editor will not allow the Journal to be used for wordy controversy; and I hope he will cut out from your letter all references to party, &c. &c. If I see him, I shall advise him to do so. I hope the letter, when it appears, may be such that I need not write at all. As it is now, I could scarcely avoid doing so, though it would be very painful to me to speak upon these matters again. In conclusion, however, if I learn that your communication is to appear intact, my present intention is to send a copy of this letter to appear in the same issue of the Journal.

I am, dear Sir,
Faithfully yours,
JAMES GLAISHER.

To Major Russell, &c.

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"Photography and its quondam Friends."

To the Editor of the Photographic Journal.

2 Fair Mead Villas, Albert Road, Peckham,
June 16, 1865.

SIR,—As I presume the coarsely personal and quite uncalled-for attack made upon me in the last issue of your Journal owes its publicity rather to accident than to design on your part, I trust, in justice to myself and the Society you represent, this short reply will not be refused insertion.

1. With reference to the perfectly justifiable quotation from the *Art-Student*, when it was written I only knew that the North London Photographic Association had announced the Exhibition in question as being under its care, and that the objectionable classification had been advertised in the daily papers; hence my satirical question. The explanation came long afterwards.

2. As to the paper read at the South London Photographic Society, so far from that Society seeking "protection from such unmeaning and wordy declamations on Art," I was specially requested at one Meeting to read such a paper at the next, and, on promising to do so, was loudly applauded.

3. The quesion "*have*" Mr. Wall ever produced a photograph may be answered in the affirmative; he "have." I was nineteen years of age when I took my first Daguerreotype, and have exhibited photographs of my own production at several provincial and at one London Exhibition. As a photographer, I consider myself an amateur who might have done better things if, as a painter, I had not devoted so large a portion of time to my profession.

Should your strange contributor desire a few more facts from my personal history, will he kindly call and ask for them at my private address?

A. H. WALL,
V. P. South London Photographic Society.

⁂ Since Mr. Wall sent us the above letter for insertion, he has requested that it may be withdrawn; but inasmuch as he has addressed a letter of complaint to one of the Vice-Presidents of the Society, impugning our conduct and fair criticism, we are compelled in self-defence to offer a few remarks, however unpleasant it may be. We have moreover heard of observations made which, if heeded, would entirely deprive the Editor of any independent power of judgment in the conduct of the Journal.

The article refered to was *not* inserted by accident, was not by a strange contributor, as he assumes, but, as he might readily have seen, was fair editorial comment. We hold it to be our duty to resent any indignity done to photography or its followers. To imply that it would be wise of photographers to give up their claims to art, and to "eat humble pie," was certainly far from complimentary to photography or followers of the art. It was not personal, as Mr. Wall, as a person, has no especial interest either for the Editor or his readers. We are glad that he really has produced a photograph; but he should remember that this fact in no wise makes him a photographer or an authority on photography, any more than Brummel's admission that he had once eaten a pea made him a vegetarian.

We were not aware that Mr. Wall was a painter; we have never heard of any of his pictures, with the exception of scenic backgrounds and coloured photographs, nor have we heard of any one who has.

Mr. Wall, as an editor and literary man, ought to know that "if he have" is in the subjunctive or conditional mood. We refer him to Lindley Murray, and may mention the pages in the Abridgment (probably most accessible to him)—page 33, and the rule of Syntax xix. page 59.

The fact that the paper was asked for by the Society ought to have placed the author under greater responsibility to have treated the subject judiciously and thoughtfully, and not to have made it a vehicle for foolish declamation, personal allusion, and *ad captandum* criticism.

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

THE following review of the Exhibition, from the 'Illustrated London News,' appearing to be an independent criticism from a non-photographic writer, we have transferred it to our columns as a record of public opinion:—It may well appear not a little surprising that, after struggling on for ten years, the Annual Photographic Exhibition can no longer maintain an independent existence; and that, after removing from place to place, almost every year seeking a new home, it now appears as a modest adjunct to the Architectural Exhibition in Conduit Street. When we think of the enormous extension, both of the practice of, and demand for, photography,—when we recollect the varied applications of the art, and that it is now cultivated by high and low, at home and abroad by an army of amateurs as well as by professionals, by ladies and men of rank as well as by the intelligent mechanics who contribute to industrial exhibitions,—that it has a literature of its own, and supports several journals,—and that there is hardly a home in the three kingdoms without a sun-picture of some sort,—it does, we say, appear remarkable that a self-supporting exhibition cannot be established. Yet for some years, we believe, the receipts from the Exhibition have not equalled the expenses; and the last and present exhibitions especially have been very inadequately representative of the progress of the art in various directions. Doubtless some blame must be attached to the management for these untoward results. The repeated alterations of the place and season of exhibition have alone been sufficient cause for numbers of the general public overlooking the show altogether. But the body of photographers must also be charged with unaccountable and, we suspect, illiberal neglect of a great means of advancing their art, and securing it a definite and respectable status.

A new complaint to be made this year is the absence of a catalogue. It is true that the title, method, and name of executant are affixed to each contribution. But, though this innovation is so far entirely commendable, it does not supersede the uses of a catalogue to those who wish to make comparisons and preserve a record. A more serious deficiency, however, is, as we have already intimated, the absence of examples of some new processes, of several valuable applications of the art, and of some of its most skilful practitioners. The only specimen of the too-much-vaunted Wöthlytype is completely, and we need not add tastelessly, obscured by colour. There are no specimens of the photozincography and photolithography employed by Colonel Sir Henry James, in conjunction with the methods of chromo-carbon printing developed by Captain Scott for the multiplication of copies of the "Ordnance Survey," "Domesday Book," &c. Some other processes of heliography, affording means for using printers' ink, and carbon printing, are likewise not represented. In this Exhibition surely there should also be specimens of the admirable photography from the Farnley Hall Turners, by Messrs. Caldesi, and other recent photographs after the same master; together with sheets of the photographic fac-similes of Shakspeare's first folios. Photosculpture, "crystal cubes," and other useful and ornamental applications of photography would also contribute to give the display a more popular character. As regards photosculpture, however, we may repeat what we said on its first appearance—namely, that it is not likely to win any but most qualified admiration from persons with a just conception of the nature of sculpture as a fine art. Moreover, until photosculptures are produced in London, as at Paris, by the aid of a large number of simultaneous photographs from different points of view, and not merely from a half-dozen of such photographs, we shall not be disposed to accord to the invention even the moderate amount of credit it may fairly claim when properly carried out. It is utterly impossible for a photosculpture from a small number of views of a figure or object to have the actual or closely-approximate photographic accuracy claimed for the invention, whatever the degree of resemblance it may (but is not likely to) derive from the generally inferior sculptors employed to round off the ridges left after using the pantograph. The peculiar value of photography in copying architecture and sculpture should be more fully illustrated in such fine studies as those of the Architectural Photographic Society (though even these are surpassed by the French), and in such examples as have been on former occasions contributed by the Stereoscopic Company and by Messrs. Thurston Thompson, Lake Price, Dixon Piper, and others. We miss, too, from this Exhibition the exquisite "studies" of the Viscountess Hawarden, the artistic "out-of-focus" portraits of painters by Mr. Winfield, the beautiful vignettes of Mr. T. R. Williams, and the productions of some proficients in the management of figure-subjects.

However, notwithstanding these drawbacks —notwithstanding that the Exhibition is far from being so comprehensive as we think the Society ought to strive to make it, yet it is very interesting and in many ways instructive. The great discovery of the year is Mr. Wharton Simpson's new method of printing with the collodio-chloride of silver, and it is here exemplified (we wish it had been more fully) in three or four diverse tones of colour, one landscene in a bistre tone being marvellously delicate and aërial. The process is as simple as it is beautiful; and, to Mr. Simpson's great honour, it is presented to photographers at large as common property unfettered by restrictions of any kind. The principle of the process is founded on the possibility of suspending chloride of silver in collodion in such a fine state of subdivision as to constitute something very nearly resembling a solution—a chemical fact so unexpected as to excite the surprise of every member of the Photographic Society present on its announcement.

The nearest approach to art, or rather the most bold and successful application of the principles of fine-art to photography, will be found in several portraits of literary men and painters, and studies from women and children, intended as illustrations of "Faith," "Hope," "Charity," &c., by Miss Julia Cameron. These photographs are "out of focus," but, for the most part, not extravagantly so, like some former works by this lady. We are disposed to think that some of their softness of outline, breadth, and (as we might almost say) their apparent lifelike capability of movement is obtained—so general and equalized are these qualities—by some mechanical contrivance other than by simple manipulation with the lenses. At all events, these attempts by scientific means to imitate nature not only as she is, but as we see her, afford rare pleasure to artists, and irrefragably establish many leading principles of art which have been ignored even by a certain class of painters themselves. How it is that these principles have not been more generally adopted by portrait-photographers we are at a loss to understand. How it is, above all, that greater attention is not paid to lighting we cannot conceive. Light, instead of being the greatest friend, is, we verily believe, the greatest enemy to the mass of photographers; and until we see three-fourths of their glass houses bricked up they will never be able to secure the one great charm of art within their reach, the broad, simple, and regulated chiaroscuro of Rembrandt, Correggio, and Velasquez. These productions by Miss Cameron, a portrait composition by Mr. Twyman, with two or three portraits by Mr. H. P. Robinson, one or two by Claudet, a few vignettes, and a solar-camera enlargement of the head of Tennyson by Mr. Mayall, are among the few figure-subjects here which have any very decided art-value in their lighting; and the remark can apply in very limited degree to vignettes. The portrait composition by Mr. Twyman, just mentioned, represents a musical club, "Our Society," as it is called. The various members are well arranged; but what is more remarkable is the very diverse gradations of tone and degrees of definiteness with which they appear, according to their relative position—variations that are excellent in intention, though carried somewhat too far. But this, like all photographs produced from "positives" joined together from several "negatives," is open to the charge of violating our faith in the understood, or what should be the understood, conditions of photographic representation. The same objection applies in a more limited degree to Mr. Robinson's "picture compositions," of which the most noteworthy is "The Lady of Shalott." After making this deduction we must, however, admit that Mr. Robinson's contributions are, as usual, preeminent for artistic feeling in idea, arrangement, breadth, selection of models, and accessories, combined with manipulative skill. But the most curious examples from more than one negative, and the most successful in their concealment of all traces of joining, are the "doubles" or "Siamese" photographs of Mr. Gill, in which we see a man shaking hands with himself, or drinking to himself, or squaring up to himself, a little girl wheeling herself along in a perambulator, and such like supernatural phenomena. The more ordinary "ghost trick" in photography, of which there are examples here, was noticed on a former occasion. Several beautiful subjects have been obtained by Mr. Rouch from the statuary and flowers in a handsome conservatory. Much taste is displayed by Mr. S. Thompson in his vignette "book illustrations."

We have given warm commendation to some photographs of the face and figure that appear to us to indicate artistic knowledge or feeling, because, without a certain amount of artistic treatment, photographs, more especially of the face, are, from various imperfections of the process, false to our impressions and destructive of the beauty of nature. But it is not to be concealed that there are many classes of subject in which any such treatment, or anything short of the utmost sharpness and accuracy of which photography is susceptible, would be wholly out of place. It must also be admitted that photography is never more legitimately employed than as a scientific record, wholly independent of art. Its value when so employed is indicated, for instance, in the photographs, by Mr. How, of numerous microscopic organisms and structures. It will be readily understood that applications of photography such as this must be an immense assistance to chemistry, medicine, geology, and many branches of scientific inquiry. The photographs also by Mr. Bedford of buildings, sites, and scenes in the East are unsurpassed for delicacy and multiplicity of details, and have therefore the quality which, in photographic representations of such subjects, is of primary importance. On the other hand, Mr. Walker's photographs of more familiar scenes are also to be highly esteemed, because, while they have less detail where detail is of less interest, they are equally records of natural effect, although they render paramount those broad gradations which it is the aim of the artist to secure. The contributions of the two last-named exhibitors are instructively placed side by side, and evince how entirely distinct may be the works of two photographers—distinct, almost, as their several handwritings, or as the styles of different artists. Mr. Mudd, the results of whose manipulations lie, for the most part, between these two last, is represented in several admirable examples. The highest praise is also due to the Indian photographs of Messrs. Macfarlane and Buxton, their purity and beauty being the more remarkable on account of the greater difficulties imposed on the photographer by the climate. Some instantaneous stereographs, by Mr. Blanchard, of seaside views, with clouds and breaking waves, and a series of photographs of the animals in the Zoological Society's Gardens, by Messrs. Melhuish and Hayes, exemplify two of the many useful applications of the more rapid processes.

The carbon process of Mr. Swan we should have mentioned before as a novelty promising most valuable results. It may be remembered that we last year spoke in high terms of this process of printing (in which indestructible carbon takes the place of always more or less fugitive silver); but we spoke with some reservation, because the process was only illustrated in landscapes, not in portraiture. This year, however, there is a portrait, and we must say that it is the best example of the employment of carbon we have seen. Though unnecessarily black, and still lacking the extreme delicacy of a silver print, we have never yet seen the gradations and modelling of flesh so tenderly rendered by the material. Mr. Pouncy, who claims to be the originator of carbon printing, exhibits some examples; but, as these are prepared for enamelling, they are not fair specimens of his method. By-the-way, there are some beautiful monochrome and also several coloured photographic enamels. Lastly, Mr. Burgess exhibits specimens of ordinary printing on a material he calls "eburneum," resembling in its soft tone and semi-transparent texture the finest ivory. The material is, we believe, gelatine, opalized, in a state of fusion, with white lead.

On Vitrified Photographs.

By MM. Maréchal and Tessié du Motay.

We have the honour to present to the Academy of Sciences some specimens of vitrified photographs, obtained by a method which we are desirous of submitting to its judgment.

This method is applicable to the production of photographic images of all kinds on flint and crown glass, enamel, porcelain, fayence, &c.

It consists of a series of ten operations, which we shall describe summarily in their order.

1. In 100 parts of benzole we dissolve four parts of caoutchouc, to which is added one part of collodion. This compound is poured on any of the substances on which we wish directly to produce a vitrifiable photographic image; we then dry it, either in the air or in an oven, so that there remains a very adherent pellicle.

2. On this first layer, thus dried, we pour iodized collodion. This second layer unites directly to the first, and acquires thus a resistance at least equal to that of a caoutchouc leaf of the same thickness—a resistance which no collodion possesses.

3. After having immersed the double layer thus prepared in the bath of nitrate of silver, we produce the image either in the camera obscura or by superposition.

4. The latent image being thus produced, we develope by any of the ordinary means.

5. We fix the image thus developed by immersing it successively in two baths containing solutions, one of iodocyanides and the other of alkaline cyanides.

6. We immerse the image thus fixed for a few minutes in a solution of protosulphate of iron, pyrogallic or any other acid which reduces silver salts.

7. We strengthen the image by the action of pyrogallic acid, of gallic acid, of formic acid, or of protosulphate of iron, or an acid solution of nitrate of silver. This strengthening requires, on the average, the use of four to six strengthening baths for images which are to be seen by reflexion, and twelve to fifteen for those to be seen by transparence. During this operation of strengthening, the images are moreover washed three or four times in alternate baths containing solutions of iodocyanides and of alkaline cyanides, then immediately afterwards in solutions of protosulphate of iron, pyrogallic acid, or other reducers of silver-salts.

The consecutive use of baths of iodocyanides and alkaline cyanides effects the complete solution of the non-adherent argentous powders precipitated on the whole surface of the image by each strengthening bath, without destroying the original design, which is thus alone strengthened. The washings in the reducing baths, by rendering neutral or acid the surface of the metallic layer, powerfully increase the final action of the strengthening baths.

8. The photographic image being developed, fixed, and strengthened, we immerse it for a few hours either in baths of chloride or of nitrate of platinum, or in alternate baths of chloride of gold and of nitrate of platinum, or, once again,

in baths of chloride of gold. During this treatment the silver of the image is partially replaced either by platinum or by a mixture of platinum and gold. The object of these various baths, which replace the layer of silver, is either to vary the colour or the nature of the image after it is vitrified. For when we wish to obtain images of a greenish-black colour by the action of siliceous or boracic fluxes in the muffle, we first immerse these images in a bath of chloride or of nitrate of platinum; when, on the contrary, we want to obtain black images, we dip them consecutively in baths of chloride of gold and of nitrate of platinum. If we desire gilt images exclusively, we immerse in baths containing nothing but gold.

9. The image on coming out of the platinum or gold bath is washed in a bath of alkaline cyanide, or of the strongest solution of ammonia; it is then covered with a varnish of caoutchouc or of gutta percha, and subjected to the action of a muffle which burns the organic matters, leaving the metals exposed.

10. Lastly, the image thus freed from collodion and other organic substances is covered with a silicic or boracic flux, and exposed to the action of an orange-red heat, which vitrifies it.

The object of our method is the indefinitely prolonged conservation of photographic images. It is the development of the principles which serve as the basis of photography on collodion and on paper by means of silver-salts. It thus differs essentially from the methods of enamelling by chromates and persalts of iron recently invented by MM. Poitevin and Lafon de Camarsac.

Practically, it is easy, thanks to the use of the combined pellicle of caoutchouc and of collodion, which alone renders it possible to submit the image, without tearing or displacing it, to a great number of strengthenings and of washings. Artistically, it is recommended in a general manner by its numerous applications to the decoration of all kinds of siliceous substances, and in a special manner by its application to glass. For we can obtain by its means vitrified images visible either by reflection or by transparence, which hitherto have not been produced by any known scientific method.

Scientifically, finally, it shows the property which alternate baths of alkaline cyanides and iodocyanides have of completely dissolving (1) the pulverulent or incompletely reduced silver which remains constantly united to the metallic silver after developing and fixing the image, and which resists the dissolving action of the hyposulphites, of ammonia, and even of the baths of alkaline cyanides taken alone; (2) of dissolving also the silver precipitates which are non-adherent to the image itself, leaving intact the metal which forms the image, and which it strengthens alone. It serves also to show that the pulverulent or incompletely reduced silver which resists the solvent action of the hyposulphites, of ammonia, and of cyanides, as well as the non-adherent metallic precipitates produced by the precipitation of silver in the strengthening baths, are partially indifferent to the substituting action of the baths of platinum and gold.—*Comptes Rendus,* June 12.

MISCELLANEA.

Copies of Turner's Pictures.—The 'Illustrated London News' says, in noticing the fine series of photographs by Mr. Thurston Thompson, from the Turner pictures in the National Gallery, published by Marion and Co.:—"Some of them are wonderfully successful in giving not only the broad masses of light and shade of the originals, but also much of the tenderness and atmosphere for which so many of Turner's works are remarkable. The series includes some of the most masterly productions of the great painter, ranging from 1803 to 1846. As studies for the artist they are invaluable, and as choice examples of art they must be equally acceptable to the general public."

Photographic Competition.—The 'Athenæum' says:—"London topographers of the future may thank us for the information that, at certain 'photographic establishments' not a hundred miles from Chelsea, the appetites as well as the vanity of the public are stimulated by the offer of an 'eel-pie and your likeness for sixpence.' In these cases, the combined charms of the offer are employed in aid of two apparently irreconcileable branches of science; but, in another case, which is really like a gastromantic incantation, as practised of old, the added temptation to 'your likeness' is a cup of coffee. So keen-edged is modern competition, that two men who had united their respective crafts, in photography and tobacco-selling, quarrelled; one of them, the 'professor,' immediately opened a tobacco-shop next door to his quondam partner, and completely cut him out by the offer of 'your likeness and a cigar for sixpence.'"

National Portrait Exhibition.—The Lords of the Committee of Council on Education have received a letter from the Earl of Derby, suggesting the formation of a National Portrait Exhibition, from which letter the following extracts are made:—"I have long thought that a National Portrait Exhibition, chronologically arranged, might not only possess great historical interest by bringing together portraits of all the most eminent contemporaries of their respective eras, but might also serve to illustrate the progress and condition, at various periods, of British art. My idea, therefore, would be to admit either portraits of eminent men, though by inferior or unknown artists, or portraits by eminent artists, though of obscure or unknown individuals. I have, of course, no means of knowing, or estimating, the number of such portraits which may exist in the country; but I am persuaded that, exclusive of the large collections in many great houses, there are very many scattered about by ones and twos and threes in private families, the owners of which, though they could not be persuaded to part with them, would willingly spare them for a few months for a public object." * * "The question of one, two, or three exhibitions in consecutive years would, I apprehend, be mainly decided by the result of future inquiries as to the probable number of pictures which could be obtained, and the space which could be found for their exhibition. But whether the period over which each exhibition (if more than one) should range be longer or shorter, the point on which I should set the greatest value, in an historical if not in an artistic point of view, would be the strict maintenance of the chronological series. I shall be very happy if any suggestion of mine should lead the Committee of Council to take up seriously, and carry out, with such alterations of detail as experience might suggest, a scheme which I think could hardly fail of being generally interesting; and I should have much pleasure in placing temporarily at their disposal any portraits from my collection at Knowsley which they might think suitable for their purpose." Their lordships state that they consider these suggestions very valuable, and will carry into effect, in the year 1866, a National Portrait Exhibition generally in accordance with them. They propose to constitute a Committee of Advice, and to invite the Trustees of the National Portrait Gallery to be members of it. Mr. Samuel Redgrave, to whose valuable labours the successful formation of the Collection of Portrait Miniatures is chiefly due, is to be requested to undertake the special charge of carrying this minute into effect.

Book Illustration by Photography.—A life of the late Mr. Cobden, by Mr. M'Gilchrist, with four photographs—a portrait, and views of Dunford, Midhurst, and West Lavington Churchyard—will shortly be published.

Art Students.—A return made to the Commons' Select Committee of last Session on the Schools of Art established in the chief towns in the kingdom shows, among the higher class of students, 2 Cambridge professors, 2 journalists, 62 clergymen and ministers, 38 solicitors, 33 physicians and surgeons, 28 apothecaries and chemists, 230 architects and their apprentices, 82 manufacturers and millowners, 106 merchants and shipowners, 57 landsurveyors, 665 clerks. Of course, there is a large number—1513—of teachers, governesses, and pupil teachers, and 1283 are returned only as schoolboys and schoolgirls. About half the students range under the artisan and industrial class, on whose behalf the Government has insisted, as a condition of State aid, on evening classes at 6*d*. a week. The return shows 692 engineers, 509 carpenters, 458 painters, 292 carvers, 264 engravers, 255 mechanics, 219 cabinetmakers, 215 builders and their apprentices, 213 masons and stonecutters, 146 designers, 129 draughtsmen, 110 patternmakers and designers, 95 iron-manufacturers or workers, 79 modellers and moulders, 74 upholsterers, 73 jewellers, 70 lithographers, 74 shipbuilders and carpenters, 68 metal-workers, 67 glass-painters, 65 plasterers, 39 lapidaries, 38 photographers, 14 ornamental writers, 2 ticket-writers. But the list is by no means confined to persons whose present calling requires art-instruction. There are 81 shopmen and shopwomen, 63 drapers, 55 warehousemen and boys, 55 tailors, 54 smiths, 53 ironmongers, 47 farmers, 46 grocers, 42 coachbuilders, 37 printers, 30 bricklayers, 30 shoemakers, 30 weavers, 29 plumbers, 25 victuallers, 15 publicans, 24 watchmakers, 22 messengers and office-boys, 20 excise and customs officers, 19 mariners, 18 bakers, 13 butchers, 8 pawnbrokers, 5 policemen, 2 timekeepers, 2 church vergers, and, in fact, a much longer list than the reader would be willing to go through.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

Alpha.—The resignation of a Member can only be accepted after the payment of all arrears. In future every resignation will be strictly reported to the Committee, and their authority obtained for the removal of any name from the lists.

A. L. S.—The two numbers out of print of the Journal have now been reprinted, and a complete set may be obtained; but very few copies remain in store. Some of the early numbers have gone through three editions.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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The North-Eastern London Exhibition.

THE Exhibition of Arts and Manufactures for North-eastern London will be opened on the 16th, with a grand ceremony, in which the National Choral Society, of one thousand voices, under the direction of Mr. G. W. Martin, will take part. Through the energy of the indefatigable chairman, Mr. W. Hislop, and the Committee of the North London Photographic Association, the photographic section of this exhibition will be one of the largest and best that have been held in London. All the most eminent names connected with the art will be represented. Bedford, England, Robinson, Mudd, and a host of others, with whose works our readers are familiar, have sent selections from their finest works; and there is every reason to hope that this will be one of the most complete displays of photography that has yet been brought before the public.

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In closing the unsatisfactory correspondence which has occupied already too much of our space during the last few months, as the explanation connected with it occupied more time than was pleasant at the last Meeting, it may be well to add a few observations on the general subject. However desirable it may be to evoke a soul of goodness out of things evil, it is a somewhat difficult task to derive much that is either good or pleasant from the small jealousies and petty gossip of narrow-minded or evil-disposed persons, examples of either or both of which are undoubtedly to be found at work in the origin of this foolish business, to which too much prominence has been given; but we will endeavour to make a few observations which may tend to prevent a recurrence of these small but irritating misunderstandings. It may be urged that if the persons or their efforts have been so small and insignificant it was scarcely worth our while to give so much attention to them; but we may reply, in the words of Professor de Morgan, that a man's ability or importance, personally, is by no means the measure of his power to cause mischief. Great evils may spring from small causes, and it is for that reason that we desire to add a few remarks on what appears to us the fundamental blunder in this matter. Of course it will be readily seen by our readers that nothing is to be gained by arguing with one so unreasonable and unreasoning as Major Russell, since he so evidently prefers the conclusions at which he arrives, by what he mistakenly deems his own shrewdness, to the distinct and unqualified asseverations of ourselves and other honourable and trustworthy men, we must leave him in his fond delusions. We cannot pretend to follow him through the labyrinth of words by which he endeavours to prove that he was right in his conjectures as to the authorship of our article with which he was pleased to find fault. By a similar process of reasoning we are afraid he would be able to include the greater portion not only of the members of the last Meeting, but of the photographic community at large, amongst those who are involved in complicity with the ideas expressed in our leader in the Journal for May.

Photographers generally, and rightly we

think, have a strong bias in favour of doing justice to all who have made discoveries and published them liberally and modestly. And it was with the simple view of rendering such justice, and with no intention to slight Major Russell, that we referred to the discoveries of others which had been recalled to our memory by the reading of Major Russell's paper, and the conversations thereon which naturally ensued. Before dismissing the personal part of the question we may add that we regard Major Russell as having removed from himself the stigma which attached to the underhand character of the proceedings which originated this unpleasantness; we see no reason to doubt that his part in this matter has resulted rather from error of judgment than error of intention, and aptly illustrates the motto of the copy-book, that "evil communications corrupt good manners."

One of the thoughts which this subject has forcibly brought under our attention, is the importance of a proper understanding of the relation subsisting between an Editor and his readers. The question of impersonal journalism is too extensive a subject for discussion here; but we may remark that, rightly or wrongly, it has been adopted as the wisest and most beneficial course, that the organs of thought should depend for their influence rather on the character of the thoughts promulgated, and the ability with which they are expressed, than on the name or personality of the writer. The leading journals and serials, daily, weekly, monthly, and quarterly, have, as a rule, strictly maintained this impersonality. In most cases the editor or conductor is unknown, almost in all instances the contributions are anonymous. In scientific journalism it has been found convenient that the name of the conductor of a periodical should be appended, as some voucher for the trustworthy character of the contributions on subjects in advance of the education of many of its readers. It is, however, a well-understood thing that all contributions not signed by the name or initials of the contributor are issued under the sanction of editorial responsibility. No matter by whom an article may be actually written, if the editor insert it as his own it is to all intents and purposes his expression of opinion, and he is solely responsible for it. It can be of no consequence to the readers *who* states a proveable fact or who expresses an opinion which is the legitimate inference from such proveable fact, and still less so if these facts and opinions appear in what is especially and technically known as an editorial article, or "leader." So much for the general relation on this subject between the editor and his readers.

But whilst all this is true in relation to this Journal, its Editor bears another position to such of his readers as are Members of the Society. As Secretary of the Society, he is honourably responsible to its Members, not only as the executive officer of the Society, but as Editor of the Journal which records its proceedings. If any sentiment or statement be untrue or offensive, in an ordinary journal, to any of its readers, there is a recognized mode of seeking a remedy. A "letter to the Editor" is often a valuable safety-valve for offended vanity, as well as a means of correcting accidental error, or enforcing the truth. In the majority of instances this would be the natural mode, and certainly the delicate and courteous one, of setting anything right which might have appeared wrong in these pages. But there is for Members of the Society "another way," as Mrs. Rundell would phrase it, but one which few persons of good feeling would resort to, unless the former had proved unsuccessful. It would be quite competent for an aggrieved member to appeal to the Council—a body elected from the Members, and at least fairly representing the good sense and ability of the Society generally. With their decison on any subject the Editor and the Members generally might alike be reasonably satisfied; but it is unfair to any individual officer, uncourteous to the Society at large, and undignified in itself, for any individual Member to complain of a Society grievance to one of its Vice-Presidents. Every Member of the Society, with any right feeling, must have felt deeply the painful and unfair position in which Mr. Glaisher was placed by the correspondence against which he had to protest at the last meeting. In the hands of a man less scrupulously honourable and straightforward, much mischief might have arisen out of a system of complaint conducted under the seal of privacy, and in some instances under a plea of brotherhood to which it is not necessary to make further allusion. Secrecy (and all indirection), as a rule, means mischief, and straightforward men never attempt to right wrongs by indirect means.

There is another curious reflection which has been suggested in the course of this correspondence. More than once dark suspicions have been thrown out, of something very wrong in the state of the Society. The reader of history and the observer of mankind must have remarked that both in nations and communities real or imaginary private wrong is sought to be resented under a guise of zeal for the public welfare. The frothiest demagogue is often a disappointed placeman, and he who has lost the election for the place of parish beadle is the first to cry out, The church is in danger. Because a gentleman fancies he has been the subject of adverse criticism in the Society's journal—and our readers know that it is only fancy—he forthwith discovers that there is something rotten in the state of the Society; and he whose zeal for the welfare of the journal, professedly so great, never induced him to contribute a line on the subject of his researches to its pages, would now, willingly, fill interminable columns in regard to an imaginary personal offence.

Another reflection before we conclude. Suspicion has been said to be the result of intense self-consciousness. A man most readily suspects another of that of which he is most capable himself. We can only conclude therefore that the charges of the existence of "cliques" arise from the fact that the writers themselves know that they belong to cliques—that the charges of indirect proceding, undue influence, and mental reservation arise from the writers being aware of the existence of these petty vices in their own clique. *We* know of no clique in the Society but that one with which this want of harmony seems to have originated.

The Dublin Exhibition—Photographic Department.

(Second Notice.)

In our June Number we gave a general glance at this Exhibition; we now propose to enter into a more detailed account of the specimens exhibited.

As in all exhibitions of English photographs landscapes are preeminent, so also is Mr. Bedford preeminent in landscape-photography. It is true, he has nothing in the present Exhibition but what we are perfectly familiar with, and it is a test of merit that a picture once seen cannot be forgotten; yet we always feel satisfaction in looking upon his beautiful works, so perfect in manipulation and so artistic in selection and treatment. The sadly deficient catalogue informs us that Mr. Bedford exhibits "Portraits and Studies," the compiler having evidently mistaken a frame of Mr. Dallas's photo-engravings, which contain some copies from Mr. Bedford's negatives as specimens of his process, for this gentleman's contribution. One of the most beautiful of Mr. Bedford's pictures is "Glen Lledr." He exhibits twenty subjects, amongst which are "Warwick Castle," "The Castle Grove, Kenilworth," "The Rood Screen, Hereford Cathedral," "Interior of Beauchamp Chapel," "Coast View, Ilfracombe," and "The Temple of Philæ." There are also some of his cabinet views exhibited in Mr. Frith's frames; why, is not explained.

Closely following Mr. Bedford's pictures in merit, though widely different in subject, Mr. England's Alpine views claim admiring attention. He exhibits several frames of 9×7 views, and a large collection of stereoscopic pictures of Swiss scenery, all exhibiting the well-known perfection for which this artist's works are famous. Mr. Mudd sends a large collection of his prints from collodio-albumen negatives, which speak volumes in favour of this process. His "Borrowdale, Cumberland," is a grand landscape, of great size and perfection of detail: composition, light and shade, and pictorial effect have evidently been studied to make this the perfect picture it is. The "River Tay" is another of those scenes which it seems to be Mr. Mudd's good fortune to be continually meeting with. Mr. Annan has a series of Scottish scenery, of a large size, unusually good pictorially, and satisfactory photographically; he also sends some snow-scenes, in which he has perfectly mastered the difficulties of these difficult subjects. It is to be regretted that, in the absence of a better catalogue, he did not write the names of the scenes he has represented on the mounts. Amongst the views we recognize as having seen before, and remembered with pleasure, is that delicious panorama, "Willows by the Water-courses." Messrs. Beauford and Bruce, "photographic publishers of all Ireland," have a great collection of views, on a stand specially provided for them. They are not good: with the high-sounding title these photographers have given themselves, they should do something better for the credit of their country. Mr. F. M. Good has some capital photographs and stereoscopic views: his groups of rustic figures are especially admirable.

All who attended our Exhibition in Conduit Street must have noticed the fine display made by Mr. T. M. Brownrigg. He exhibits twenty-five frames, containing pictures which display a true feeling for the beautiful. A "Hawthorn Tree in Blossom, Phœnix Park, Dublin," is excellent, as also are "The Bridge on the Nore" and "Toro Lake, Killarney." Mr. W. H. Warner exhibits some views which will not add to his reputation. The Viscountess Joscelyn has some pretty groups and admirable landscapes. We do not remember that Mr. Dixon Piper has exhibited lately at the usual exhibitions; he has here a good collection of his old pictures, with a few new ones. "On the Greta" and a "View in Yorkshire" are charming examples of atmospheric effect. Mr. Wardley, one of our best dry-plate photographers, has some admirable views of the English lakes, especially noticeable for their delicacy and clearness. Mr. Rouch's well-known landscapes, of the cabinet size, and copies of statuary are much admired for their delicacy and softness, although there has been a slight tendency to over-printing in some of them. Mr. Baynham Jones's and Mr. G. S. Penny's tannin and malt pictures show that fine effects may be got by this method. We would call attention to the fine effect of chiaroscuro in the "View in Gloucester" by the former. Mr. Vernon Heath has twenty-seven frames of landscapes, remarkable for their manipulative excellence. "Windsor Castle" is one of the most effective of the photographs he exhibits.

By far the most beautiful of the productions of amateurs are the views in the neighbourhood of Castletownsend, by Sir J. J. Coghill. These charming pictures are all that could be wished for, possessing in a high degree pictorial excellence and mechanical skill, besides a brightness and freshness of effect seldom met with in the usual run of photographs. Mr. J. Bull, of Cheltenham, has some views in Wales, possessing much the same qualities as those by Sir J. J. Coghill; "Llandudno Bay" and the "Menai Bridge" are beautiful reproductions of difficult subjects. The Countess of Ross and the Rev. T. M. Raven exhibit some good specimens of the wax-paper process.

The seventeen frames of prize pictures exhibited by the Amateur Photographic Association induce a feeling of astonishment that the large and valuable prizes offered by this Society have not had much effect in stimulating amateurs to produce better work. The Manchester Photographic Society exhibit a large collection of capital pictures, chiefly from collodio-albumen negatives, for which process this Society is famous. Mr. B. Costerdine, Mr. J. H. Young, Mr. C. Hebert, Mr. W. S. Mabley, Mr. H. Petschler, and Mr. J. H. Underwood are the principal contributors. Mr. Mabley has a view at Bettws-y-Coed especially charming—composition, light and shade, and tone perfect; the sky is well managed to concentrate the light. Mr. Petschler's snow-scenes are very good; and Mr. Underwood's stereographs and views are as charming as anything in the Exhibition. Besides his contributions to the Manchester Society's collection, Mr. Mabley has some beautiful studies of cattle. Messrs. Johnson and Co. have some pretty views with picturesque clouds, which are much better in every respect than their cartes-de-visite or the collection of hard stereoscopic transparencies they exhibit. Major Halford has some stereoscopic views of Dytchley, Oxon, the seat of Viscount Dillon, and some instantaneous views at Ventnor, which will repay careful attention; some cattle-pictures by this gentleman are amongst the best we have seen. Mr. Sanderson, of Manchester, sends some excellent views of that photographing-ground of the Manchester school, the English Lakes. Messrs. MacLean and Haes send the series of wild animals photographed in the Zoological Gardens on which Mr. Haes read a paper at a recent meeting of the Society. Lieut.-Col. Verschoyle has a collection of views from collodio-albumen negatives: there is every indication that the negatives were good; but the printing by the Wöthlytype process is slaty and cold, and so coarse that the prints have the appearance of being from wax-paper negatives. The stereographs of Killarney and other Irish scenery, by Mares, are black and heavy, probably from under-exposure. Mr. Maxwell Lyte and Mr. Gillis exhibited some very beautiful views in the Pyrenees: the picturesque and ivy-clad "Pont de Betharram," by the latter, is a very striking and effective picture.

Of marine and instantaneous pictures there are very few; but the two best operators in this department are well represented. We of course allude to Mr. Breese and Mr. Blanchard. Mr. Breese's well-known round table of stereoscopes attracts a great deal of attention, as it did in the International Exhibition of 1862. It is much to be regretted that this skilful photographer has not added any new productions to his collection since that time. The few he has done are undoubtedly the finest things of their kind, by a long way, that have ever been exhibited to the public. A few new pictures every year would convince photographers that such splendid success could be always obtained at the will of the operator. In another (and quite as original) direction, Mr. Blanchard's sea-views are preeminent. Those he exhibits have not the advantage of being shown as transparencies on glass, but they have all the delicacy of Mr. Breese's pictures, and excel in poetic feeling anything of the kind in this Exhibition.

The portraits which attract most attention, for the singularity of the arrangement as well as for the quality of the work, are Mr. Mayall's enlargements of Tennyson, and of Capt. Grant, the companion of Speke in the Nile explorations. There are eight portraits of each gentleman, graduating in size from carte-de-visite up to colossal dimensions. With the exception of a small amount of touching, these are as perfect enlargements as we have seen. The London Stereoscopic Company have also an enlarged bust of the poet-laureate, but which appears to have been indebted to the brush for its effectiveness. M. Claudet exhibits a collection of his large portraits taken direct in the camera, as well as some enlargements and cartes-de-visite. His frame of three heads of Rowland Hill is one of his best contributions. Amongst the few coloured photographs we have seen and admired, those we find here by Messrs. Lock and Whitfield are amongst the best. These consist of portraits of the Prince and Princess of Wales and infant Prince. The large standing figure of the Princess in the centre of the screen is very charming, but the background would be improved by a little more variety. The United Association of Photography exhibit some specimens of what must have been very beautiful coloured pictures; but the colours in most of them, especially those on ivory, have become much faded, and have a rotten, decomposed appearance; it will be a serious impediment to the success of the Wöthlytype process if it be found that the prints produced by it are not capable of bearing colour.

Mr. Twyman has some large heads which are very artistic and effective. His double printed portrait of Sir Moses Montefiore is not quite so much to our taste; to give effect to the head all other lights have been smothered; this is especially noticeable in the open window, which is much darker than the head. Mr. W. Hanson's vignetted portraits, good in themselves, are spoilt by the affected mounting; it is now recognized by the most successful photographers that a photograph cannot be too plainly mounted. Mr. Silvy is another offender in this direction, some of his photographs were really worthy of a good place; but the hanging committee of this Exhibition seem to have come to the same conclusion as the committee who managed the Conduit Street Exhibition, that black frames and gray mounts do not agree with the quiet gold bead and white mount now almost universally employed for photographs, and have been compelled to isolate them. Messrs. Maull and Polyblank send some of their well-known whole plate portraits, which display an evenness of execution from which they never appear to vary; their cartes-de-visite also possess the same qualities. Mr. A. Beau has a novel application of cartes, which he calls revolving portraits; they consist of cards, both sides of which contain pictures, the one side has the front of the figure and the other the back.

The professional photographers of Dublin do not appear to have arrived at the success which has been achieved in England and Scotland. Mr. Cranfield, of Grafton Street, perhaps, makes the best display with a large case of portraits coloured in oils. Messrs. Millard and Robinson, of Sackville Street, send some landscapes, specimens of carbon-printing and enamels, and some pictures coloured in oil. One of Lord Brougham is especially good. They also exhibit a Daguerreotype of the first Photographic Gallery in Dublin in 1842. Mr. Chancellor, Messrs. Nelson and Marshall, and several other Dublin photographers exhibit some *cartes de visite* that should not have obtained a place. Mr. Horsburg, of Edinburgh, has a frame of *cartes de visite*, which he has labelled Age, Maturity, Youth, and Childhood, beginning with Age; but we found it difficult to discover the difference in some of them, Youth and Maturity being represented of the same size.

Some portraits exhibited by Mr. G. Schröder, Grafton Street, we have long been familiar with, as the productions of the late Mr. Lacy, of Ryde. It is a well-known fact that the lowest class of photographers sometimes beg, borrow, or steal, or extract, from establishments in which they have been plate-cleaners, or assistant printers, specimens of the work of their employers, to hang out at their doors as their own work. It is unimportant to the consideration, at present, by what method the specimens of other photographers have been obtained; but it is too bad for a photographer to exhibit as his own work, in an Exhibition like this, pictures which are easily recognized (and have been long admired) as the productions of another.

Scarcely one of the representatives of that class of photography which is more nearly allied to fine art is absent. Mr. H. P. Robinson's productions are so well known to our readers that we need not say more than that his pictures fill one screen, and occupy an honourable position in the centre of the middle room. Amongst them is the famous "Bringing Home the May," "The Lady of Shalott," "A Holiday in the Woods," "Autumn," "Brenda," &c., as well as a frame of *cartes*. Mr. Rejlander has an enormous collection of studies. Some of his earlier pictures are as interesting as when they were first exhibited, and make us regret that he should not have continued to produce complete pictures instead of the sketchy fragments to which he has devoted himself of late. What can be more beautiful than his delicious Landscape from several negatives, "Home, sweet Home," or "Mind your Complexion," and others of his earlier period. Two of his pictures, the one called "Too Late," and the other "Early Morn," are indecent, and should not have been exhibited. A photograph of a nude female figure is inexcusable at the best; but when that figure is deformed and in a very questionable attitude, regard for the feelings of the visitors to the exhibition should compel its withdrawal.

One small group of pictures brought painfully to our mind a loss that our art has sustained. It consisted of five frames of studies by the late Viscountess Hawarden: some of them we had seen and admired before; the new pictures showed the same delicacy and power as those with which our readers are familiar. With a mastery of light and shade peculiarly her own, combined with a delicacy which contrasts, with wonderful force, with some other attempts at securing light and shade in photography, but without any delicacy at all, exhibited by another lady in the same building. These pictures, by Lady Hawarden, are amongst the gems of the Exhibition.

Amongst the young photographers who will have to sustain the high level to which the art has been brought by those whom we suppose we shall soon have to call the veterans of the art, we look upon Mr. H. Cooper, jun., as the foremost. His contributions, although marred by some affectations, such as "The Monk," display a fine feeling for art, and a great knowledge of mechanical photography—two qualities not often allied. "The Laughing Boy," "The Sneeze," "Thirty Years Ago," and many others do credit to Mr. Cooper, both as an artist and as a photographer. Of Mrs. Cameron, we are sorry to say, we have very little hope; she exhibits many of the pictures she contributed to the Conduit Street Exhibition; but some of them are printed so dark as to be almost invisible. In the portrait of Tennyson it is very difficult to make out the features; and this is a fault that photography certainly should not possess. In the two pictures of "The Wise and Foolish Virgins" it is difficult to distinguish which are the "Wise" and which are the "Foolish," the same models being employed for, and looking equally foolish in, both pictures. We are sorry to speak in condemnation of a lady's work; but these photographs have been put prominently forward, and we should be doing an injustice to photography to let them pass as examples of good art or perfect photography.

Mr. Blanchard exhibits some studies that induce us to believe he will attain some position in this difficult branch of the art. His picture of two little girls at play in a studio is very charming.

Dr. Hemphill exhibits some groups of an ambitious character, showing a knowledge of grouping. His landscapes and figures are distinguishable for a delicacy and beauty which is very pleasing. Messrs. Bullock Brothers exhibit their picture entitled "Nearing Home," against the irreverence of which we found it necessary to protest in our notice of the last exhibition of the Photographic Society of Scotland. They now show another of the same class, representing the Angel appearing to the Shepherds. If it were not for the subject, this picture would be quite comic in its effect. The Angel, a very coarse one, seems to have thoroughly astonished the shepherds. The shepherds are represented by men with their trousers tucked up, but otherwise dressed in blankets. This subject is too high for any photographer, and we would recommend these gentlemen to try something more on a level with their abilities.

Reproductions in the English department are very scanty, but those by Mr. Thurston Thompson from Turner's pictures are more attractive than most of the pictures shown.

There is a very good display of the results of new processes, foremost amongst which is the Collodio-chloride process of Mr. Wharton Simpson, who exhibits three very charming specimens on paper. Other variations of the Simpson type, on opal glass, &c., are exhibited by Mr. Swan and others. The badly managed Catalogue is especially bad in this instance, as Mr. Simpson's name does not appear in the second, and presumedly most correct edition, although it appeared in the first edition. This requires explanation, as apart from the injustice done to the inventor, the interest of a new process does not consist so much in the specimens exhibited, as in the description of the process, which should be found in a proper catalogue. Another instance of careless cataloguing is in the case of Mr. Osborne's famous photolithographs, which are placed in the foreign department, and attributed to W. Korn & Co.

Col. Stuart Wortley and the United Association of Photography both exhibit specimens of printing by the Wöthlytype process, which are nearly as good in tone as prints on albumenized paper. Mr. Swan sends some fine specimens of his process for printing in carbon. Mr. Dallas's specimens of landscapes, reproductions, and portraits by his photo-engraving process, and which are named in the blundering catalogue "Bedford, F., London—Portraits and Studies," are exceedingly interesting, and make us anxious to see his invention worked out commercially; nothing could be better for a book-illustration than the "View of Kenilworth," done by this method. Mr. Helsby has an attractive case of specimens of the process he has named "Helioaristotypia." The Casket Portrait Company has a large case of their charming portraits, which unfortunately arrived too late to obtain a place where they could be seen to advantage. The International Photosculpture Company display a large collection of statuettes, busts, medallions, &c., which attract much attention, the statuettes especially are very pretty. There are very few specimens of photo-enamels; Mr. Silvy shows one of the best by Lafon de Camarsac's process. Dr. Maddox's photo-micrographs occupy a special table, as do also the photo-micrographs of Messrs. Abercrombie and Wilson. It seems impossible to go beyond the perfection which is displayed in both these collections. Mr. F. Wilson has a photograph of a drawing of a monogram of the alphabet, which is especially worth finding out and studying.

The foreign department is not very attractive, consisting as it does principally of unframed copies of pictures and drawings; there are some good touched-up enlargements. There is one picture calling for special attention—an enormous enlargement of a flea by M. Duvette, of Paris, which is wonderfully clear and well defined.

In the Colonies, Mr. A. Henderson, of Montreal, has some delicate landscapes, and there is a small portrait labelled "The intelligent Zulu who convinced Bishop Colenso of Biblical inconsistence."

Of the apparatus we shall have very little to say. Mr. Dallmeyer's fine case of astronomical and terrestrial telescopes, microscopes, and photographic lenses and cameras is one of the "sights" in the body of the building. Mr. Meagher has a large case of monster cameras and stands, complete sets of apparatus, pantoscopic cameras, cabinet cameras, stereoscopes, &c., &c., all displaying the well-known care and skill for which he is famous. Mr. Solomon has a case containing specimens of everything required in the art, including several ingenious contrivances he has patented for cutting round prints, washing, &c.; and Messrs. Ottewill, Collis, & Co. have an important collection of cameras of all kinds.

In taking leave of this exhibition, we cannot help expressing our admiration at the manner in which it has been arranged and the pictures have been hung, and our regret that the blundering and meagre catalogue should have seriously impaired the delight and instruction to be derived from such an excellent exhibition of photographs.

On a Mode of measuring the Relative Sensitiveness of Photographic Papers.

By Arthur M'Dougall, B.Sc.

[From the Journal of the Chemical Society.]

Up to the present time no attempt has been made to represent quantitatively the changes in tint produced upon photographically prepared papers when exposed to a known amount of light, or to express in terms of a given standard the sensitiveness of any of the photographic preparations. At Professor Roscoe's suggestion, I have endeavoured to take the first step towards the attainment of a knowledge of these quantitative relations by determining the relative sensitiveness of photographic papers prepared with varying quantities of different sensitizing agents, defining relative sensitiveness to be represented by the reciprocals of the times during which the several papers must be exposed to a constant source of light in order that they may all attain the same tint as determined by the monochromatic soda-flame. As, however, it is clearly impossible to determine directly the exact times during which papers of different degrees of sensitiveness must be exposed to light, in order that each shall attain precisely the same tint, use was made of the law established by Professors Bunsen and Roscoe in their last paper on photochemical measurements[*], viz. that equal degrees of tint upon sensitive chloride-of-silver paper are produced by equal products of the intensity of the acting light into the time of exposure,—light of the intensity 50, for example, acting for the time 1, producing the same blackening effect as light of the intensity 1 acting for the time 50.

According to the method of measurement founded upon this law, the relative sensitiveness of the different papers can be determined by exposing them for the same time, or for different known times, to the action of a constant source of light, and by comparing the tints thus obtained with the positions of identical shade upon a strip of paper prepared in the pendulum photometer (Phil. Trans. 1863, p. 140). By reference to Table I. of the above-mentioned paper the relative times of exposure are obtained which were needed to produce the tints in question upon the standard paper; the reciprocals of these times give, then, according to our definition, the relative sensitiveness of the papers. In most cases it is necessary that the times of exposure of the various papers be made different, in order that each paper shall attain one of the requisite tints, and not become either too light or too dark. The results obtained from the table must, in these cases, be multiplied by the reciprocals of the times of exposure, in order that the required sensitiveness may be obtained. It thus becomes necessary to determine the relation of these times of exposure with a greater degree of accuracy than can be attained by merely uncovering and covering the papers by the hand. This is effected by exposing the papers in an instrument, which may be termed the disk photometer, by means of which, not only the papers can be exposed with accuracy for different known times, varying from 1·00 to 3·11, but any errors arising from variation in the intensity of the daylight are eliminated.

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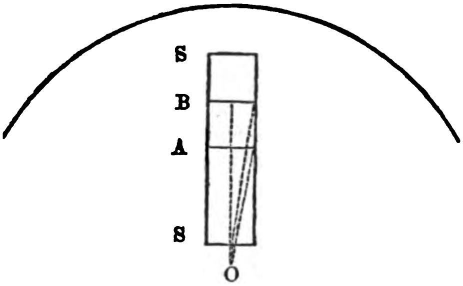
[*] Phil. Trans. 1863, p. 139.

The instrument consists of a metallic disk 353 mm. in diameter, having a rectangular slit 48 mm. wide by 144 mm. long, cut out at a distance of 15·5 mm. from the centre of the disk, as represented at SS, fig. 1. The disk rotates upon a vertical axis, so that it can be made to pass horizontally close above the sensitized papers, which are placed upon a block at known distances from the centre of the disk, along a line parallel to a radius of the circular disk. The relative times during which the several papers will be exposed on every revolution of the disk can be calculated when the distance of the papers from the centre of the disk and the breadth of the slit are given. Thus, if A and B, fig. 1, represent two pieces of paper placed at the distances a and b from the centre O of the disk, and if the breadth of the slit be c, we have

Fig. 1.



$$\frac{\text{The time of exposure of paper A}}{\text{The time of exposure of paper B}} = \frac{\sin^{-1}\frac{\frac{1}{2}c}{b}}{\sin^{-1}\frac{\frac{1}{2}c}{a}}$$

The following numbers, giving the relative times of exposure in the disk-photometer for each 10 mm. are thus calculated:—

Distance from centre of disk.	Time.
150 mm.	1·000
140 "	1·071
130 "	1·154
120 "	1·251
110 "	1·367
100 "	1·506
90 "	1·678
80 "	1·895
70 "	2·175
60 "	2·551
50 "	3·112

An experiment thus made for the purpose of determining the relative sensitiveness of the photographic papers A and B, which were exposed in the disk apparatus, gave a= 52·8 mm., b=76·8 mm. On reading off the points on a pendulum strip identical in shade with A and B after exposure, the position of A was found to be 141 mm. corresponding to the time 0·482, and that of B 129·7 mm. corresponding to the time 0·540; hence the fractions $\frac{1}{482}$ and $\frac{1}{540}$ would represent the relative sensitiveness of the papers if they had both been exposed for an equal length of time. They were, however, exposed in the disk-photometer for different times, and the relations of these times is found by the expression

$$\frac{\sin^{-1}\frac{24}{52\cdot8}}{\sin^{-1}\frac{24}{76\cdot8}} = 1\cdot484,$$

and the relative sensitiveness of the papers A and B is as the numbers

$$1 : \frac{1\cdot484 \times 0\cdot540}{0\cdot482} = 1\cdot66.$$

In like manner the relative sensitiveness of any number of papers can be determined, provided (1) that the papers prepared with varying quantities of salts each possess the same degree of sensitiveness throughout their surface, and (2) that the disk-photometer is found to fulfil its functions.

For the purpose of ascertaining whether the first of these conditions holds good, sheets of the best white photographic paper, 0·04 of a square metre in area, were salted by immersion in solutions containing in 100 parts the following quantities of pure chloride of sodium:—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, and 20 parts by weight. The papers salted in these different solutions were then silvered by floating for five minutes on a bath of nitrate of silver, containing 12 per cent. of silver salt. Three pieces were cut from each sheet when dry, 80 mm. apart, from the top, middle, and bottom of the sheet as it had been hung up to dry, and the three pieces exposed simultaneously to daylight. The tint which each paper had assumed was then read off upon a pendulum strip. The following numbers give the mean of ten separate readings made for each paper upon the millimetre scale of the pendulum strip, and the close agreement of the numbers in each experiment shows that the whole of each sheet of paper possesses a uniform degree of sensitiveness, the slight differences observed in the readings being due to errors of experiment:—

	1 p.c. Na.Cl.		2 p.c. Na.Cl.	
	Ex. 1.	Ex. 2.	Ex. 1.	Ex. 2.
	mm.	mm.	mm.	mm.
Top of sheet	133·6	109·5	129·0	109·2
Middle of sheet	132·0	108·6	130·0	109·0
Bottom of sheet	132·0	109·0	130·0	107·5

	3 p.c. Na.Cl.		4 p.c. Na.Cl.	
	Ex. 1.	Ex. 2.	Ex. 1.	Ex. 2.
	mm.	mm.	mm.	mm.
Top of sheet	81·0	132·6	133·8	147·1
Middle of sheet	80·0	131·7	134·5	148·1
Bottom of sheet	78·6	131·9	133·0	148·0

	5 p.c. Na.Cl.		6 p.c. Na.Cl.	7 p.c. Na.Cl.
	Ex. 1.	Ex. 2.		
	mm.	mm.	mm.	mm.
Top of sheet	135·4	138·0	134·0	89·3
Middle of sheet	134·7	139·3	132·5	86·6
Bottom of sheet	130·0	134·9	131·0	86·0

	8 p.c. Na.Cl	9 p.c. Na.Cl	10 p. c. Na.Cl.		
			Ex. 1.	Ex. 2.	Ex. 3.
	mm.	mm.	mm.	mm.	mm.
Top of sheet	138·0	141·4	88·0	130·4	121·8
Middle of sheet	134·0	138·4	91·0	128·8	120·0
Bottom of sheet	132·5	139·1	90·0	132·5	120·7

	15 p. cent. Na.Cl.	20 p.c. Na.Cl.	
		Ex. 1.	Ex. 2.
	mm.	mm.	mm.
Top of sheet	107·7	141·8	133·6
Middle of sheet	106·0	143·0	133·8
Bottom of sheet	107·0	138·0	133·2

In order to ascertain the degree of accuracy which can be attained in measurements made with the disk-photometer, a strip of paper salted in a three per cent. chloride-of-sodium solution, and silvered in the standard silver bath, was placed along the whole length of the slit, and afterwards insolated by the rotation of the disk. Portions of the paper thus exposed were then cut off at known distances along the slit, the tint of each compared with that of a pendulum strip, and the sensitiveness then calculated according to the formula given above. If the instrument works properly, the numbers thus obtained, expressing the relative sensitiveness of the various points of the paper, must be identical; that this is nearly the case is seen from the following table, giving the results of seven experiments made in this manner:—

Ex. I.		Ex. II.		Ex. III.		Ex. IV.	
Distance on slit.	Relative sensitiveness.	Distance on slit.	Relative sensitiveness.	Distance on slit.	Relative sensitiveness.	Distance on slit.	Relative sensitiveness.
mm.		mm.		mm.		mm.	
60	0·912	57	0·952	47·7	1·004	69·0	1·010
75	1·040	80	1·065	67·0	1·000	85·5	1·000
90	1·007	92	0·865	86·5	0·996	103·0	0·991
105	1·000	111	1·000	106·0	0·946	124·5	0·990
120	0·949	125	1·040	142·5	1·054		
mean 0·982		mean 0·984		mean 1·020		mean 0·998	

Ex. V.		Ex. VI.		Ex. VII.	
Distance on slit.	Relative sensitiveness.	Distance on slit.	Relative sensitiveness.	Distance on slit.	Relative sensitiveness.
mm.		mm.		mm.	
80	1·014	102	0·950	95	1·000
102	1·000	121	1·008	108	0·977
120	0·028	137·5	1·046	122	1·025
135	0·956				
mean 0·999		mean 0·999		mean 0·984	

A comparison of the numbers of each experiment shows that the mean error is not greater than can be fairly anticipated in such determinations. As a second means of testing the trustworthiness of the instrument, portions of three chloride-of-silver papers, A, B, and C, of different degrees of sensitiveness, were tinted by exposure in the disk-photometer, whilst other pieces of the same papers were insolated for known times by uncovering and covering them by hand, when the sky was cloudless, and in both cases the relative sensitiveness of the papers was determined by reading off upon a pendulum strip in the ordinary manner. The following gives the results of these measurements:—

(1.) *Insolation in Disk Photometer.*

Ex.	Relative sensitiveness.		
	Paper A.	Paper B.	Paper C.
No. 1.	1·00	1·75	2·74
No. 2.	1·00	2·46	3·20
No. 3.	1·00	2·53	2·68
No. 4.	1·00	2·31	2·75
No. 5.	1·00	2·29	3·18
No. 6.	1·00	2·63	3·32
No. 7.	1·00	2·16	3·73
Mean	1·00	2·30	3·09

(2.) *Insolation by Direct Exposure.*

	Relative sensitiveness.		
	Ex.	Paper B.	Paper C.
No. 1	1·00	2·38	3·04
No. 2	1·00	2·25	2·76
No. 3	1·00	2·41	3·82
No. 4	1·00	2·22	3·29
No. 5	1·00	2·36	3·09
Mean ..	1·00	2·30	2·96

Determination of the Relative Sensitiveness of Paper salted in Solutions of different Salts of varying strength.

The first series of measurements was made for the purpose of ascertaining the relative sensitiveness of photographic paper salted in solutions of pure chloride of sodium, containing in 100 parts quantities varying from 0·25 to 20·0 parts of salt, and all silvered in a silver bath containing 12 per cent. of nitrate. As it was impossible to expose this whole set of papers at one time in the photometer owing to the great difference in their sensitiveness, the several series of papers prepared in the solutions containing from 0·25 to 1·75 per cent. of salt, from 1 to 4 per cent., from 1 to 7 per cent., and from 7 to 20 per cent., were insolated at one time in the disk-photometer, and the numbers afterwards reduced to the sensitiveness of the 1 per cent. solution taken as the unit. The following table gives the data of six experiments made with the 1, 2, 3, and 4 per cent. papers; the numbers obtained, as a mean of ten readings, for the relative sensitiveness were—

Paper.	Ex. 1.	Ex. 2.	Ex. 3.	Ex. 4.	Ex. 5.	Ex. 6.	Mean.
1 per cent.	1·00	1·00	1·00	1·00	1·00	1·00	1·00
2 per cent.	1·86	1·66	1·89	1·84	1·63	1·84	1·79
3 per cent.	2·22	2·12	2·63	2·45	2·35	2·19	2·33
4 per cent.	3·23	3·21	3·29	3·27	3·11	3·06	3·19

In like manner the relative sensitiveness of the remaining papers was found, the mean of at least six separate experiments being taken. The following table contains the experimental results of determinations thus made for papers salted in the accompanying amounts of choride of sodium:—

Relative Sensitiveness of Papers prepared with varying quantities of Chloride of Sodium and constant excess of Nitrate of Silver.

Percentage of Chloride of Sodium.	Relative sensitiveness.	Percentage of Chloride of Sodium.	Relative sensitiveness.
0·25	0·448	6·0	4·45
0·50	0·782	7·0	4·75
1·0	1·000	8·0	4·98
1·5	1·29	9·0	5·24
2·0	1·79	10·0	5·69
3·0	2·33	15·0	6·81
4·0	3·19	20·0	7·20
5·0	3·85	....	

Determinations were next made with pure chloride of potassium, papers being salted in solutions containing, in 100 parts, 0·5, 1·0, 2·0, 4·0, and 7·0 parts of the salt, and silvered in the 12 per cent. nitrate bath.

The following numbers were obtained as a mean of three separate sets of experiments made on different days with different papers:

Strength of Chloride of Potassium solution.	Relative Sensitiveness.
0·5 per cent.	0·815
1·0 „	1·000
2·0 „	1·48
4·0 „	2·56
7·0 „	5·26

By graphical interpolation the following table is calculated:—

Relative Sensitiveness of Papers prepared with Chloride of Potassium.

Percentage of Chloride of Potassium.	Relative sensitiveness.	Percentage of Chloride of Potassium.	Relative sensitiveness.
0·5	0·800	4·0	2·50
1·0	1·000	5·0	3·30
1·5	1·20	6·0	4·15
2·0	1·45	7·0	5·20
3·0	1·95		

Papers salted in chloride-of-ammonium solutions and then silvered gave the following results, as the mean of four sets of experiments:—

Strength of Chloride of Ammonium solution.	Relative Sensitiveness.
0·5 per cent.	0·50
1·0 "	1·00
2·0 "	1·56
4·0 "	3·38
8·0 "	5·87

By graphical interpolation the following table is calculated:—

Relative Sensitiveness of Papers prepared with Chloride of Ammonium.

Percentage of Chloride of Ammonium	Relative sensitiveness.	Percentage of Chloride of Ammonium	Relative sensitiveness.
0·5	0·46	4·0	3·40
1·0	1·00	5·0	4·15
1·5	1·30	6·0	4·80
2·0	1·50	7·0	5·40
3·0	2·35	8·0	5·90

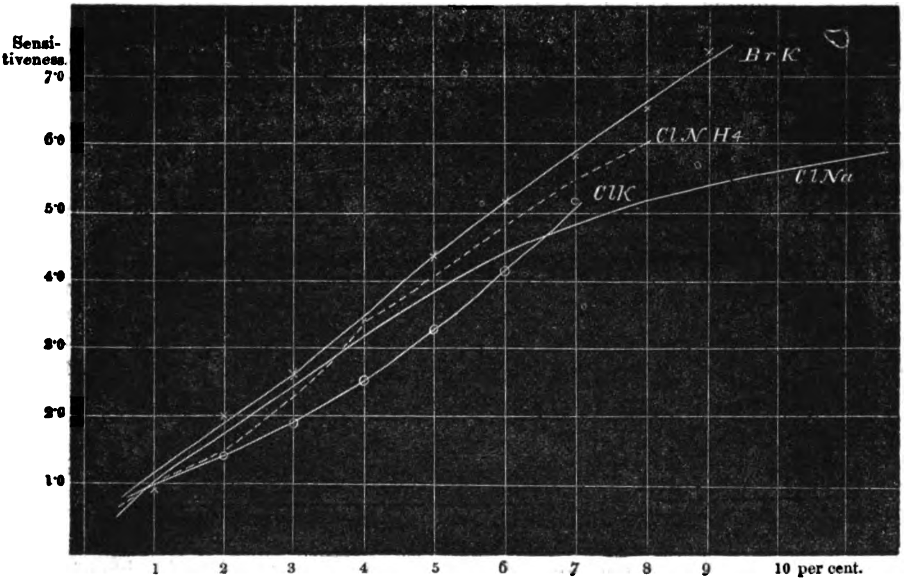
The following numbers were obtained as the mean of seven experiments on paper prepared with bromide of potassium:—

Relative Sensitiveness of Papers prepared with Bromide of Potassium.

Percentage of Bromide of Potassium.	Relative sensitiveness.	Percentage of Bromide of Potassium.	Relative sensitiveness.
0·25	0·345	5·0	4·41
0·50	0·767	6·0	5·10
1·0	1·00	7·0	5·74
2·0	1·88	8·0	6·49
3·0	2·59	9·0	7·36
4·0	3·34		

The four curves on fig. 2 represent graphically the above determinations, and from these we see that the rate of increase of sensitiveness with increase of strength of the saline solution is different for the different salts: thus, whilst the sensitiveness of bromide-of-potassium paper increases nearly proportionally to the quantity of salt added up to 9 per cent., the sensitiveness of chloride-of-sodium paper prepared from 5 to 20 per cent. solutions increases in a very much less ratio.

Fig. 2.



Iodide-of-potassium paper sensitized with excess of silver was so slightly blackened by insolation that it was found impossible to determine the relative sensitiveness of this paper.

Having ascertained the rate of increase of sensitiveness with increase in the strength of the salting solutions, it appeared of interest to determine the action of different salts containing the same quantity of haloid. For this purpose solutions were prepared containing the same quantity of chlorine combined with different metals, and papers salted in these, and afterwards silvered in the standard bath, were exposed to light at the same time, the tint of each paper being read off upon a pendulum strip.

	Relative sensitiveness.			
	Ex. 1.	Ex. 2.	Ex. 3.	Mean.
Chloride of sodium......	1·47	1·50	1·53	1·50
Chloride of potassium...	1·60	1·48	1·52	1·53
Chloride of ammonium	1·60	1·47	1·53	1·53
Chloride of barium ...	1·60	1·51	1·58	1·56

A similar series made with bromides gave the same results.

	Relative sensitiveness.				
	Ex. 1.	Ex. 2.	Ex. 3.	Ex. 4.	Mean.
Bromide of sodium.........	1·38	1·40	1·54	1·39	1·43
Bromide of potassium......	1·42	1·32	1·41	1·30	1·36
Bromide of ammonium ...	1·44	1·34	1·48	1·40	1·41
Bromide of barium.........	1·39	1·40	1·44	1·39	1·40
Bromide of quinine.........	1·43	1·41	1·51	1·37	1·48

The foregoing results show that the sensitiveness of papers containing the same quantity of chlorine and bromine combined with sodium, potassium, ammonium, and barium is constant within the limit of experimental error, and, therefore, that the influence of the metal upon the sensitiveness of the papers is not appreciable.

◆

New Photographic Chemical Investigations regarding the Sensitiveness of Iodide of Silver.

By Dr. Hermann Vogel*.

Numerous investigations have been made in the last few years on the theory of photography, on the nature of those peculiar changes which chloride, bromide, and iodide of silver undergo in the light, and the influence which these changes exert in producing pictures. Yet, notwithstanding the great diligence which has been displayed in these experiments, and the interesting data which they have yielded, their influence on photographic practice has been but of insubordinate importance. Practice has preceded theory, and has taught the latter more than it has learnt from it. This is especially the case with the negative process.

In so far it is not surprising that practice has more admirers than theory; that comparatively few experimenters occupy themselves with the latter, while the number of those who seek to perfect the former is legion.

Yet I cannot but give in to the conviction that the future of photography depends alone on a more accurate recognition of the physical and chemical processes which light produces; and hence I have unceasingly continued those investigations of which the first part has already appeared*; and I give to the public, as a further fruit of my studies, a series of results which, as I think, clear up the obscurity which still prevails over many photographic-chemical processes.

Light acts on many chemical compounds quite analogously to heat.

There are many compounds which are directly decomposed by heat,—for instance, oxide of mercury, *oxide of silver*, which merely, by heat, split up into their constituents; others, again, are only decomposed by heat in the presence of a body which can combine with one of the elements which becomes free,—thus oxide of copper and sesquioxide of iron in the presence of hydrogen.

Similar are the actions of light. Certain bodies—as oxide of silver or of mercury, or chloride of silver—are directly decomposed by light, others only in the presence of a body which can unite with one of the liberated constituents; thus *sesquichloride of iron*, uranium-salts, chromates, &c., in the presence of organic substances (ether, paper, &c.), which absorb the liberated chlorine or its corresponding oxygen; *water*, in the presence of chlorine, which unites with the hydrogen to form hydrochloric acid. Those foreign substances which induce the decomposition of many bodies by light play an important part in photography; even in the case in which a body directly sensitive is concerned, whose decomposition in the presence of such substances is far more energetic. The entire difference between Davanne and myself on the question whether chloride of silver is reduced in the light to subchloride or to *metallic* silver depends simply on the condition, whether chloride of silver is exposed to light in the pure state or in contact with organic substances (paper). In the first case subchloride of silver, in the second case metallic silver is formed. Hence the deep-lying influence which paper, the sizing it contains, and collodion, exert on the photographic processes.

The deportment of chloride of silver and of bromide of silver in the light is pretty simple. Both are decomposed in the pure state *with liberation of chlorine and bromine,* leaving a violet or greyish-violet body, which gives up no metallic silver to nitric acid (*vide loc. cit.*).

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* Poggendorff's Annalen, June, 1865.

* Photographic Journal, vols. viii. & ix.

The deportment of iodide of silver, on the contrary, is more enigmatical That precipitated with excess of iodide of potassium does not change *at all* in the light; that with an excess of silver salt becomes coloured of a pale greyish green, *without a trace of iodine becoming free,* a circumstance which led me to assume that iodide of silver undergoes no decomposition at all in the light.

Why is pure iodide of silver, precipitated with excess of iodine, insensitive to light? Why is that precipitated with excess of silver sensitive? Of what nature is the change which the latter undergoes? Why does nitrate of silver promote so materially the action of light on iodide of silver, &c.?

The obscurity which prevails over these actions of light could not but be deepened when Poitevin came out with the singular discovery that tannin and similar substances act as *sensitisers,* that is, favour the change of iodide of silver in the light, just as does solution of nitrate of silver (Photogr. Archiv, 1863).

Tannin, a substance so entirely different from silver salt—one a reducing, the other an oxidizing agent—acts analogously to the silver salt.

How is this enigma to be solved?

Long reflection, and several experiments grounded thereupon, showed that both bodies, *nitrate of silver* and *tannin,* however different, have yet something in common; *both absorb free iodine with ease.* If solution of silver be dropped into iodized starch, decolorization immediately ensues (upon this depends my method of determining silver*). If *solution of tannin or of gallic acid* be added to iodized starch, it is also decolorized.

These facts led me to the supposition that *iodide of silver* behaves in the light just as do salts of uranium, of sesquioxide of iron—that is, is only decomposible in the presence of a body which can absorb *iodine.*

In order to test this supposition, I selected a third body, which also readily absorbs free iodine, but in its other properties differs essentially from nitrate of silver as well as from tannin, that is, *arsenite of soda.*

5 grms. arsenious acid, and
2½ grms. carbonate of soda,

were dissolved in 50 cub. cent. water, and this solution poured upon some iodide of silver precipitated with excess of iodide of potassium, and therefore insensitive as regards light. *Spite of the dull daylight, after a few minutes a slight darkening was perceptible.* On the next morning the iodide of silver was just as *greenish*-coloured as if it had been exposed under solution of nitrate of silver. The experiment was made in direct sunlight. In this case, on agitation the iodide of silver *became greyish green even in a few seconds.* A specimen placed at the same time in the dark was not changed in the least.

I next investigated several bodies which powerfully absorb iodine; and first *subnitrate of mercury,* as neutral as possible. .

Even in diffused light, the iodide of silver under this solution became *green* in a few minutes.

A second specimen placed in the dark remained quite bright yellow.

A third substance which absorbs *iodine* is *tartarized antimony.* Iodized starch is decolorized by a solution of it, *though slowly,* but more rapidly in the presence of carbonate of soda; its deportment as a sensitiser was analogous thereto. *In contact with it in the light, iodide of silver changed slowly into grey, more rapidly in the presence of carbonate of soda.*

A fourth body, which powerfully absorbs iodine is *tin-salt* (protochloride of tin). I dissolved this with sal ammonic in water, and placed it on insensitive iodide of silver. Even after a few minutes it rapidly became of a greyish-green colour in diffused light; the freely suspended powder *brown.*

A specimen in the dark was not in the least coloured.

Of all bodies investigated tin-salt appears to be the most powerful sensitiser.

Tannin was next to it in its action; under this substance also the coarser particles of the iodide of silver became *green,* the finer *brown.*

On the basis of these experiments, all of which confirm the opinion I have above expressed, I think myself justified in stating the law:—*Those bodies which readily absorb free iodine and combine with it chemically, exert a sensitising action on iodide of silver, that is, they cause its change in the light.*

With regard to this, there can be no doubt that the change of iodide of silver in the light depends on a *chemical decomposition.*

Pure iodide of silver is probably *not at all* decomposible in the light.

Whether the sensitizers, even in taking up iodine, undergo a decomposition (as will in the majority of instances be the case), I disregard for the present.

That these substances, in the same manner, according to their capacity of absorbing bromine and chlorine, will also promote the decomposition of *bromide and of chloride of silver* in the light, follows as a matter of course from the preceding experiments, and has been already shown by my previous investigations. Their presence is not in this case a condition of decomposibility in light. The explanation of the enigmatical deportment of iodide of silver has now no longer any difficulty. Iodide of silver, precipitated with excess of iodide of potassium, retains a trace of iodide of potassium. The latter *cannot* chemically unite with iodine, and hence no decomposition ensues*. Iodide of silver precipitated with excess of silver salt contains still a trace of silver, which binds iodine, and hence *decomposition ensues*. Of course the traces of silver salt present can only absorb a very small quantity of iodine; hence the decomposition taking place is but feeble, and soon ceases. At the same time we obtain the explanation why formerly in the change of iodide of silver in the light I could not prove the presence of any free iodine. If, on the contrary, silver salt is present in excess, as in wet plates, the decomposition is *considerably more energetic and of longer duration*, and therefore *the greater sensitiveness.*

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* Pogg. Ann. 1865, part ii.

Tannin acts as a sensitizer because, like free silver salt, it can absorb iodine. An entire series of other phenomena may be *easily and unrestrainedly* explained from the principle laid down. I reserve this for a subsequent article.

After finding this fundamental law of photography, it will not be difficult to find hundreds of *inorganic* and *organic solid, liquid,* and *gaseous* bodies, which act, like solution of silver and tannin, as sensitisers; and, by a more careful testing, considerable results may be obtained for *photographic practice.*

It will be possible to make dry plates which, only directly before exposure to light may be made sensitive in the camera by any gaseous sensitizer; perhaps among the etherial oils, aldehydes, oleic acids, bodies will be found which absorb iodine, and are distinguished by their ready solubility in alcohol and ether, and may possibly be used in the collodion negative and positive processes without silver bath, in preference to the difficultly soluble nitrate of silver.

I will here notice one point—the green, which substance in the finely divided condition is brown, and which is formed in the decomposition of iodide of silver in light. This is probably *subiodide of silver.* I have prepared this Ag_2I by the action of iodide of potassium on subchloride of silver as a *green powder*, which in its aspect quite resembled iodide of silver altered by light.

Berlin, March, 1865.

Major Russell and the Photographic Society.

To the Editor of the Photographic Journal.

August 10, 1865.

Sir,—I am sorry that the nature of the answer to my letter in your last Number compels me to trouble you once more. As to the matter having been "fully discussed and disposed of," I am not aware of any previous discussion, unless one side only having spoken can be so called.

You only gave references to the dates of Mr. Wardley's and Mr. Leahy's publications, &c., and stated generally that Mr. Simpson had not written to the Journal for some months. The entire absence of any explanation of the grounds of my opinions tended to confirm me in the idea that I was substantially right; yet I intimated that, having stated my views to you, I did not wish to press the matter further. I was, however, compelled to do so in self-defence. Your fairness to myself was exemplified by the unfounded imputations and abuse which you allowed to appear in the Journal.

Having long before been requested by Mr. Glaisher to read a paper before the Society, I at first declined, on account of the unreasonable opposition which I expected. At last I consented to prepare a paper: you have convinced me that in so doing I made a great mistake. So far from considering the reception of my paper a failure, I thought myself fortunate in meeting, as it appeared, with no opposition. I did not expect to get any credit, but fancied that a connected outline of the results of my labours during the last ten years might be of some interest to a few.

I was quite prepared for an open exhibition of hostility, but was not prepared for what seems to have taken place—that after I was gone, "when the meeting was adjourned, the Members" talked more freely, and questioned the originality of "the knowledge," . . . . : "which made an exact reference needful." This private conclave seems to have eagerly caught at everything which, in their ignorance of the subject, they thought could be made to tell against me. I am quite at a loss to conceive what I had done to deserve such treatment, as, on that and all other occasions, I felt pleasure in acknowledging my obligation to every one to whom I was indebted for an idea. If any one present had any doubt, he might have asked me straightforwardly whether such and such opinions were in any way suggested by what such a person had published. I would have answered him willingly, and all unpleasantness would have been avoided.

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* According to a private communication of my friend Carey Lea, in Philadelphia, iodide of silver, precipitated with excess of iodide of potassium, is, however, sensitive in *strong* light; and he states that he has even produced pictures upon it. Doubtless the organic matters of collodion have essentially cooperated. I have recently found that even iodide-of-silver paper becomes brown in the light after a month's exposure.

Your mention of Dr. Hill Norris's plates is quite beside the question: for anything I know to the contrary, they may be better than mine. I never had any idea of wishing it to be thought that I was the only person who could prepare sensitive dry plates. The method recommended by Mr. Hughes is, in all essential particulars, precisely that published by me long ago, as he would tell you. Were it otherwise, it would have nothing to do with the matter, as I never pretended that my process was the only one which would succeed. My intention was to give a plain account of how I had been led to certain principles, and how I had best succeeded in making them practically available.

Your objection to what you call my doctrine of blurring is a very simple one. The fault can be produced on paper negatives by reflection when glass is before the paper, or when glass or any other reflecting substance is behind it. If you like to deny a fact which any one can easily prove in a few minutes, it is no concern of mine. I do not know why you mention the subject, unless to suggest a possible cause of ill feeling in certain quarters.

Your memory seems rather at fault; I therefore remind you that I objected to the notion that I derived my ideas from Mr. Leahy, not to the mention of his name. As you fully believed that my discovery was independent, it is rather remarkable that you should have so evidently insinuated that I took it from him, and that you should think it worth while to say that Mr. Leahy's letter was published on the 23rd October, when it was dated on that day, but was published in a Journal which appeared on the 7th November. Your erroneous statement would make it possible that I might have been guilty of piracy, but is otherwise immaterial, as I do not dispute priority of publication. Had not the insinuation referred to involved an imputation of dishonourable conduct, I might probably have passed the article over as beneath my notice.

It seems to me rather a far-fetched explanation, that you had to go back more than two years to find in your contemporary a piece of compliment wherewith to season your dish of underhand detraction. That you "had not the honour of any knowledge," &c., is unfortunately contradicted by notices in your Journal, and by a passage in one of your letters to me. You say that I have made a "reassertion" which is "perfectly unwarrantable." You have mistaken me; I made no such reassertion.

Excuse me if I misunderstand you, but it does not appear to me that you say that Mr. Simpson is, as I have said I should be glad to hear, free from all complicity about the ideas embodied in the article. If you could say that he was not one of the conclave of *private Members* who discussed and made out the detractive matter after the May meeting, I suppose that you would do so. From what I have recently heard from Mr. Simpson, I conclude that I gave him too great prominence in the matter: if in this way, or in any other, I have done him any injustice, I am sorry for it. Those who were so creditably occupied may divide the credit among them as they see fit; not being behind the scenes, I cannot do it for them.

In regard to what you "have yet to learn," I have already said why I particularly objected to the article if it came from Mr. Simpson. I am quite willing to believe that you are not aware that you are in the hands of a party. To show that there is something in that which you say needs no refutation, I need go no further for an instance than the article on my paper.

Besides what I have referred to as contained in a letter to you, in a letter to Mr. Glaisher, some time before the May meeting, and which I think you have seen, I said that I was unwilling to do anything which, however indirectly, might reflect on you. After these things, if I held you personally responsible, I should wonder that you ventured to make the insinuation in your last sentence, if I understand it.

Evasive, unfair, and full of mispresentations as your answer is, yet it has, by what it says and by what it leaves unanswered, so far substantially justified me, that I need say no more on the subject, and I shall not, unless compelled to do so by any fresh attack or misrepresentation. As you well know, I have been forced into a contest by the extraordinary conduct of others. I have endeavoured to say nothing unpleasant to any one beyond what I thought necessary to my own defence and justification.

In conclusion, I call on you to retract the offensive language unjustly applied to me in a leading article of the 'Photographic Journal' (June 15), and to apologize for admitting into the same Number letters containing similar matter; or to say plainly, without shuffling, that you will not do so. In the latter case, I ask honourable and independent men whether they will support the Society under such circumstances. C. Russell.

[We are not aware of any "unfounded opinions and abuse" of the writer having appeared in this Journal. The article in question we consider fair criticism, formed independently upon the recorded facts in the various photographic Journals.

We disclaim all wish to detract from Major Russell's discoveries, and decline to retract any observations or offer any apology where none is called for. We have never accused him of that which he states, any more than we have called his paper "a failure." Mr. Leahy's discovery of alkaline development is unquestionable. We have assured him in every way possible that Mr. Simpson is in no way responsible for our opinions. We have no recollection of even speaking to that gentleman after the evening meeting in June; but there are "none so blind as those who *will* not see," and we may add that we cannot convince those who refuse all the assertions which have been made.

Having now given insertion to Major Russell's communications on this subject at a greater length than will, we fear, be thought interesting to our readers, we must bring the matter to a close. We shall be very happy to give insertion to Major Russell's communications on any practical subject, but must decline to admit any further continuation of a controversy of which our readers must be as weary as ourselves.

In the note appended to Major Russell's last letter, the word "personal" was accidentally omitted.]—Ed.

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To the Editor of the Photographic Journal.

Dear Dr. Diamond,—In your last issue Major Russell avows himself to be one of the persons referred to by the Vice-President, Mr. Glaisher, as A, B, and C, in the singular explanation which, for the health of the Society, he felt necessary to make at the last meeting. In his letter Major Russell apologizes to me for having erroneously stated that I was the writer of a certain article in your pages of which he did not approve. I accept his apology, so far as it goes; but must regret that it is accompanied with insinuations which deprive it of much of its grace.

It is unnecessary that I should reply to those insinuations or the other statements of the letter, as you have, in the note appended to it, so effectually answered all that was said and implied. You have, in that note, intimated that my published opinions did influence some portions of the article in question, a circumstance of course as gratifying to me as it is legitimate in itself. Personally I feel bound, however, in justice to you, and for the satisfaction which I am willing, in courtesy, to give Major Russell, to repeat not only that I did not write the article in question, but that I did not either directly instigate or suggest it; and that personally I never used any influence, directly or indirectly, in the Journal to the injury of Major Russell or anyone else. It is very probable that the article, or the ideas contained in it, had their origin, as you suggest, in the conversation which took place after the meeting in May; such conversation I remember, although I took but little part therein.

There is only one matter in Major Russell's letter which I feel concerned to answer. He says that I *knew* that he used the alkaline development prior to the publication of Mr. Leahy's letter. The inference suggested by this statement is that I knew, prior to the publication of that letter, that Major Russell had made a similar discovery. This is altogether an error. I did not know it. I had no means of knowing it. My first knowledge of alkaline development was derived from Mr. Leahy, who, in a letter dated October 23rd, 1862, informed me that he found it possible to develop a tannin plate with a solution of ammonia. I delayed the publication of this letter for a week, in order to obtain time for verifying the experiment. I published the letter in the 'Photographic News' of November 7th, 1862, and heard nothing further of the matter until I saw an announcement in a contemporary journal of November 15th, 1862, by Major Russell, stating the effect of pyrogallic acid and ammonia in developing tannin plates. In answer to a private letter shortly after this, Major Russell informed me that he had been experimenting with that mode of development since September, a statement to which I at once gave publicity in my own pages. How long Mr. Leahy had been experimenting I do not know. I have no doubt whatever that Major Russell made an independent discovery of this method of development, and I have always, publicly and privately, given him credit for it. I do not know that, in a case of almost simultaneous independent discovery, the question of absolute priority can make much difference in the honour; but as priority of publication decides priority of claim, such difference as there is belongs to Mr. Leahy. I make this explanation of the facts with no wish to detract from the credit due to Major Russell, for whom, until the recent unfortunate *étourderie* into which he has been led, I have always felt the highest respect and esteem.

I will not occupy your space with further comment on this foolish business further than to express my conviction that it has arisen out of a singular misconception of the responsibility of the Editor, of the rights of the reader to inquire into the authorship and origin of editorial articles, and of the proper source of redress for real or fancied wrongs. I also wish, after the publication of Major Russell's letter, to withdraw any expression I have before used in commenting on the secrecy of his course in this matter. G. Wharton Simpson.

On the Selection of a Subject, and its Management. By H. P. Robinson.

One of the greatest difficulties in art, and one which evinces the greatest knowledge of it, both in painter and photographer, is the choice of a subject. It is not only necessary that the object be worth representing, but that it is possible to represent it at all. Many artists fail, not because they are bad painters or bad photographers, but because they have selected a theme which would be impossible to the greatest masters in either art to embody with the limited means their art places at their disposal.

Pictures seldom present themselves ready made, but they exist in all nature, and it is for the artist to find them out. Chance often presents objects which suggest ideas, and it is for the artist to "grasp the skirts of happy chance," and turn these ideas to advantage.

It is a mistake often made to attempt too much at once—to try to astonish the world at one blow. It is a vain hope. In all the world of art or poetry, or, indeed, in any other department of life, this has been seldom done, and, when done, the unlucky author has "struck twelve all at once," and has never been able to again reach the level of his first effort.

There is more art displayed in making a picture out of an insignificant subject than out of a great one; and the insignificant subjects are more prevalent than the others. So, as Pope says,

"If Queensbury to strip there's no compelling,
'Tis from a handmaid we must paint our Helen."

If it be necessary to paint her at all, especially stripped, seeing that Mr. Leighton has proved, in his picture exhibited in the last Academy Exhibition, that it is possible to make her beautiful without being nude; and I might remark, in passing, on the offensive folly of some artists, who think that nudity *must* be art, when in most cases, especially photographic, it is mere vulgarity: the art that is obliged to have recourse to indecency to produce its effects is not an art that will elevate the mind or purify the taste.

Genius in a great measure consists in a desire for work, whatever rhapsodists may say to the contrary. It is of no use, now-a-days, marching about in long hair and a slouched hat, talking the cant of art, and smoking the blackest of pipes. However much genius a man may possess, it is of little use to him unless accompanied by that earnest energy which results in work. Much mischief is done by idle people, who, having read and misunderstood books on art, which magnify the glory of an artistic career, do nothing, after having entered the student's course, but *talk* about their own glory, and that of their occupation. "Pleasant vices" are epidemic, and the idle ones talk the workers from their work, and thus many a great artist is lost to the world. For all this, it was never intended that, though a man does his utmost, he should break his heart over it. An artist must be happy in his work, it must be a pleasure and a delight to him; but, as Ruskin says, "in order that people may be happy in their work, these three things are needful:—they must be fit for it; they must not do too much of it; and they must have a sense of success in it—not a doubtful sense, such as needs some testimony of other people for its confirmation, but a sure sense, or rather knowledge, that so much work has been done well, and fruitfully done, whatever the world may say or think about it. So that in order that a man may be happy, it is necessary that he should not only be capable of his work, but a good judge of his work." And herein lies the great secret of all art, especially photographic art,—the knowledge of what is good—in fact, the power of "seeing." Learn to "see," and success must follow.

"But the eye only sees that it brings with it the power to see." By a slight stretch of poetic licence, it has been asserted that a finished statue exists in the unhewn block of marble, and that the sculptor, seeing it there, merely chips away the surrounding stone which hides the statue in all its beauty from the common eye. Something analogous to this is really true in dealing with many a photographic subject. To speak of landscape, for instance. How often have I known photographers traverse miles of lovely country, full of pictures, without finding anything they thought worth exposing a plate upon—travelling from Dan to Beersheba, and declaring all to be barren. And this simply because the pictures were not isolated and cut out for them from proximity with parts of other pictures which they joined. Nature appears at times coy, and displays not some of her most seductive charms to those who have not through much wooing and constant study won her secret. The stately tree, the frowning cliff, the towering mountain, the bursting waterfall, all are beautiful, and obviously beautiful; they form fine pictures, well worth producing, but they do not make the best pictures. Some of the photographic landscapes on which my memory lingers with the fondest affection are composed of the simplest elements; some of Mudd's, for instance, in which a calm lake is fringed with quiet foliage, a boat or a boulder in the foreground, the whole harmonious and full of atmosphere, suggesting a most delightful feeling of calm and contentment to the beholder.

I think photography has arrived at that state of perfection when we might no longer fear to acknowledge its shortcomings, and we must confess that it is not the grandest scenes in nature that make the best photographs; a photographer would be powerless to reproduce the wondrous grandeur of Chimborazo, and the gorgeous scenery of the Andes. The best pictures produced of the Alps—those by Mr. England—fail to give but a poor idea of the "peaks and passes" of that wonderful region of mountain and snow, and the photographer has found that success was only to be achieved by the selection of "bits" which afforded him an opportunity of showing the supremacy of the camera over every other method of representing the texture and cleavage of glaciers, the geological characteristics of rocks, and the varieties of trees. Our own mountains have not been adequately represented. Snowdon, towering above its satellite mountains, has never been chosen by a photographer as a subject suitable for exhibition. But the photographer can do that which would break the heart of the painter to attempt, be he never so pre-Raphaelite. He can take a close subject and represent it literally, absolutely, and actually, without leaving a possibility for anybody to doubt his word and say that he has not photographed the truth. But he has a greater power if he choose to exercise it: he is not obliged to represent everything he finds; he may alter and select: and herein lies the power which a knowledge of true art gives over the pretender to artistic knowledge, or the simply ignorant. It rarely happens in landscape work that one single object, however grand, constitutes a picture in itself; it is the composition, the relation of parts, on which pictorial excellence depends, and which the photographer should cultivate the power of perceiving. A picture may be made or marred by such an insignificant thing as the securing or omitting of a clump of bracken, gorse, or briar in the foreground to break up a dead level of greensward. The introduction of a figure may be the crowning charm of a picture, or it may be the impertinence disturbing all repose and grandeur in it, just by the sense of fitness or unfitness which is suggested by its presence.

Here is an illustration of the application of art to photographic landscape; and it is not a hypothetical case. Two friends, both pupils of my own, selected the same scene to photograph; it consisted of a shallow stream, enclosed by trees, with shingly banks running into the river—a simple subject, but one not very tempting to a photographer who was on the look-out for views of the ready-made order. The one friend, who had studied photography simply as a science, and was very learned in formulæ and processes, placed his camera on the bank, and obtained an exquisitely perfect *map* of the scene; but with all this perfection of detail, it was unsatisfactory as a picture; it was scattered, and appeared to want balance. The other friend, who added a knowledge of picture-making to his familiarity with mechanical dexterity, first surveyed the scene, and considered what could best be done to improve it. Finding that the reflection of the distance in the water caused a patch of light to divide his picture into two parts, he caused a huge dark-coloured stone to be carried into the stream, and placed at a point he indicated; this not only broke up the objectionable light, but it placed a near dark object exactly under the greatest distance, giving greater value to the receding perspective. He now found that he had got a principal dark object acting as a key-note to the composition; but he had got some masses of light and half tones scattered about that required bringing into harmony. To do this he introduced a rustic female figure in a light dress, walking over the shingle to the water; and, as the figure was near, he took the precaution of posing her carefully, and supporting her with a head-rest, an instrument much despised by some and seldom used in landscape, but which, if used carefully and judiciously, would save many pictures from the deformity of blurred figures. He now exposed his plate, and the result was a picture in the true sense of the word, not a mere photograph, the mechanical product of cameras and lenses and chemicals, but a work of art, in which you saw at once that the mind of the artist had triumphed over his subject, and that all the elements of true art, except colour, although not offensively prominent, had been observed—harmony, breadth, subordination, contrast, light and shade, and composition.

It is by these means—labour added to knowledge—that good work, in painting, sculpture, or photography, is produced. Let no man trust to what is called "good taste:" it is not sufficient without a knowledge of the rules of art, however arbitrary they might appear, to produce uniformly good results; and I mean by uniformly good results, the making the best of any subject, however bad. But a knowledge of art will not allow of the choice of an unsuitable subject, and it will teach the photographer to find beauties in the humblest things, and pictures in subjects which, before he had attained a knowledge of art, he would have passed unnoticed.

On a new very Rapid Paper for Enlarged Positives. By Dr. Van Monckhoven*.

It is well known to photographers that paper prepared with a chloride and sensitized in the usual manner yields proofs which vary in colour according to the nature of the sizing of the paper. That, for example, a very pure paper, free from sizing, gives grey and dull pictures, while the same paper, sized with gelatine or albumen, yields brilliant proofs, of a colour very agreeable to the eye. In this latter instance there is in the substance of the paper, beside chloride of silver, a kind of *lake*, formed by the combination of the sizing with the nitrate of silver employed in sensitizing.

Light, in acting upon chloride of silver, decomposes the latter into a metallic silver mixed with a violet chloride, of which, thus far, chemical analysis has not clearly established the composition. The silvery lake, on the contrary, decomposed by light, does not exhibit any traces of metallic silver. The hyposulphite of soda employed for fixing leaves on the unsized paper proof gives metallic silver only, the aspect of which is grey and dull, while upon paper sized with albumen or gelatine we find, after fixing, metallic silver, together with the kind of lake mentioned above. From this arises the beautiful colour of proofs upon paper sized with gelatine or albumen. If we stop the action of light upon a paper positive long before the picture is printed, and then continue the action by means of a dilute solution of gallic acid, a moment soon arrives when the proof assumes in the bath a colour as deep as when under the prolonged influence of the light alone. Fixed in hyposulphite of soda, however, the proof is much more grey and dull, as the sizing is less abundant in the substance of the paper.

For, if we sensitize two sheets of paper, the one with a chloride alone, without the addition of sizing, and the other with albumen alone, without chloride of sodium, it is quite evident that the first paper contains chloride of silver only, and the second an albuminate of that metal. These two papers, slightly exposed under a negative, so as to print a very weak positive, then developed by gallic acid, present a widely different aspect. The first will be grey and dull, the second, though yellowish in its substance, will exhibit a picture of a very beautiful colour. Fixed with hyposulphite of soda and dried, the first on unsized paper, will still present a grey and dull image, soluble in mercury, and formed of metallic silver; the second, on sized paper, gives a coloured picture insoluble in mercury.

In the first experiment we perceive that the gallic acid, in developing the picture, adds metallic silver to it; it is an actual intensifying, and not a true development that takes place. Upon the albuminate of silver, on the contrary, a real decomposition takes place.

Unfortunately, papers sized with resin, gelatine, and albumen turn yellow in the gallic-acid bath, and the hyposulphite of soda removes a little of their colour. Besides, the process by development is generally abandoned for the process of direct printing. I should, therefore, have nothing new to add to this process without the observation of a fact resulting from a study I have made of the decomposition of collodion.

Some two or three years ago I discovered and published the fact that the decomposition of collodion is effected by the absorption by alcohol of the nitrous elements of gun-cotton; the alcohol passing to the state of nitric ether, the gun-cotton to the state of a peculiar resin. Thus, simple collodion kept several years yields deep red pictures.

A substance akin to nitrated cotton—nitrated sugar—is decomposed much more rapidly in presence of alcohol, and gives, under the influence of light only, in presence of an excess of nitrate of silver, be it understood, a brown substance, exactly as albumen does; and what is very remarkable, instead of yellowing under the influence of gallic acid, like albuminate of silver, this substance remains white.

Now, paper immersed in an alcoholic solution of decomposed *nitrous sugar*, dried, sensitized, and exposed for a moment to the light under a negative, then immersed in gallic acid, soon gives a picture of a magnificent colour, similar to that of proofs upon albumen, and, like them, may be toned and fixed without losing the fine aspect it exhibited in the developing-bath.

I now proceed to describe my process.

I commence by preparing the *nitrous sugar*, by placing one part of pulverized sugar in a mixture of one part of sulphuric acid and one part of monohydrated nitric acid. After an action of about five minutes' duration I remove the mass out of the acid, and wash it under a stream of cold water. I next dissolve it in alcohol, and precipitate it with water. I thus obtain a white glutinous substance, which is nitrous sugar. I may add that it is a very delicate preparation, and that, in the absence of a discovery I have made of a simpler method of preparing it, my process of preparing positive paper would not have been practicable.

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* Read before the French Photographic Society, and printed in *Le Moniteur de la Photographie*.

I dissolve 20 grammes of this nitrous sugar (or nitroglucose, as it is termed in pure chemistry) in a litre of alcohol, and, when dissolved, I close the bottle with a ground-glass stopper, and place it in a sugar refiner's stove, which marks a temperature of 110° Fahr. during 8 or 10 days. At the expiration of this time all the nitro-glucose is decomposed, and the liquid, which, upon first being prepared, did not cloud a solution of nitrate of silver, now produces a white precipitate which blackens with extreme rapidity in the light.

The alcoholic liquid is poured into a porcelain dish, and the sheets of paper passed through it one by one, and suspended to dry. I employ indifferently *papier Rive*, and for proofs of large dimensions, ordinary drawing-paper, which I buy by the yard.

The paper dries in a few minutes. I then immerse it for two hours in an ordinary salting solution (10 per cent.)* and then hang it up to dry.

I can preserve the paper in this state, but I generally prefer to sensitize it at once, and keep it sensitized. To this end I simply pass it on to a solution of nitrate of silver (5 per 100); then hang it up to dry, and keep it for many months ready for use.

The extreme sensibility of this paper and the colour it assumes under the influence of light are very remarkable. As to its rapidity, all I can say is, that yesterday I took twenty-four enlarged pictures from the same negative within an hour. Each enlargement, measuring 19¼ inches by 23½, has been printed, with my apparatus, in a single minute in the sunlight, and the rest of the time has been employed in changing the paper in the printing-frame. Under an ordinary negative, in less than ten seconds in the sun, the picture is sufficiently distinct.

The colour assumed by the paper under the influence of light is a lighter and redder violet than that given by ordinary chloride of silver.

When there are a great many proofs, they are all immersed together in a bath formed of 1 gramme of gallic acid to a litre of water, and 10 cubic centimetres of glacial acetic acid. The proofs assume a magnificent colour, and, I repeat, are in every respect comparable to the finest proofs upon albumen.

After development, the proofs are toned and fixed in precisely the same manner as in the ordinary process. Dried, the proofs are coated with a varnish of gum, wax, or other substance.

I think that this process will render the question of enlargements quite practical. In fact, I have printed upon this paper from very intense and varnished negatives taken several years ago, in less than five minutes in the sun. With a transparent negative made expressly for enlarging, and with my large apparatus, a double sheet is printed in two minutes, a single sheet in one.

The silver baths being weak, there is in that particular a great economy.

Lastly, when, during winter, photographers can at present take only one or two proofs a day from their negatives, they will be able to take three hundred or more. The pictures are not in the substance of the paper, like those obtained by development, but rather on the surface.

NOTICE.

We are preparing for publication in the Journal a corrected list of the present Members of the Society, and which will appear in an early number. Any Member wishing for any alteration, addition, or change of address should express the same to the Secretary, care of the Publishers.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

Zero.—Pinholes arise from many causes; occasionally from dust, but generally from either too much or too little iodide being in the bath. When a bath has been long in use, it becomes supersaturated with iodide, which, in hot weather, the nitrate of silver will not hold in solution; it then forms minute crystals, and covers the film with a sand-like deposit, which produces pinholes. If a bath does not contain sufficient iodide, the nitrate of silver will eat holes in the film.

Folkestone.—It is too late to send to the Exhibition at the Agricultural Hall.

F. W.—We prefer a light greenish-grey for the paper in the studio. Backgrounds are most easily painted in distemper, on paper mounted on canvas. It may be procured of any size, being made for the purpose of upholstery.

H.—The medal of the Society is complete, and will be early distributed. The Secretary will be glad to receive the promised contribution. We believe the most valuable photographic medals (intrinsically) are those of the Bengal Photographic Society—the gold ones costing about sixteen guineas each, the silver ones about two pounds.

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* This large proportion of salt is surely an error.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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THE BRITISH ASSOCIATION.

[From our own Correspondent.].

THE Meeting of the British Association for the Advancement of Science, the thirty-fifth since its institution, and the third which has been held in Birmingham, has come to a close, and has been, if not one of the most successful, at least of average excellence. The number of Members and Associates enrolled did not quite reach the average of former years; neither was there any great attraction, such as the discovery of the source of the Nile or an account of a great eclipse, to relate for the instruction of the sections; and, looking at it from our point of view, what was of still greater consequence, and the more to be regretted, was the extreme paucity of matters of photographic interest, only two papers having any reference to the science, one on "Moving Photographic Figures," by Mr. Claudet, and another on "Recent Applications of Magnesium," by Mr. W. White (both of which will be found in our pages), having been read. A paper on the "Aniline Process," by Mr. Willis, was down for reading in the Journal of Sectional Proceedings, but, owing to the absence of the author, was not read.

If the business of the Meeting was not as interesting as usual, the enjoyment has equalled, if not exceeded, that of any former time. The weather was brilliant, the excursions delightful; and the hospitality of the town in which it was held is proverbial.

The inaugural Address of the President, Professor Phillips, was distinguished not only for the knowledge he displayed of his difficult subject—the whole range of science—but for the wonderful command of language in which it was expressed, and the gorgeous dress in which he clothed useful knowledge. Many who heard it must have imagined they were listening to some grand epic, rather than to a record of the progress of science. As an illustration of this remark, we extract that part of the Address which more nearly relates to our Art-Science:—

"What message comes to us with the light which springs from the distant stars, and shoots through the depths of space to fall upon the earth after tens, or hundreds, or thousands of years? It is a message from the very birth-place of light, and tells us what are the elementary substances which have influenced the refraction of the ray. Spectral analysis, that new and powerful instrument of chemical research for which we are indebted to Kirchhoff, has been taught by our countrymen to scrutinize not only planets and stars, but even to reveal the constitution of the nebulæ, those mysterious masses out of which it has been thought new suns and planets might be evolved—nursing-mothers of the stars. For a time, indeed, the resolution of some nebulæ, by the giant mirror of Lord Rosse, afforded ground for opposing the speculation of Herschel and the reasoning of Laplace, which required for their very starting-point the admission of the existence of thin gaseous expansions, with or without points or centres of incipient condensation, with or without marks of internal movement. The latest results, however, of spectral analysis of stars and nebulæ by Mr. Huggins and Professor W. A. Miller have fairly restored the balance. The nebulæ are indeed found to have in some instances stellar points, but they are not stars; the whole resembles an enormous mass of luminous gas, with an interrupted spectrum of three lines, probably agreeing with nitrogen, hydrogen, and a substance at present unknown. Stars tested by the same accurate hands are found to have a constitution like that of our own Sun, and, like it, to show the presence of several terrestrial elements—as sodium, magnesium, iron, and very often hydrogen. While in the Moon and Venus no lines whatever are found due to an atmosphere, in Jupiter and Saturn, besides the lines which are identical with some produced in our own atmosphere, there is one in the red, which may be caused by the presence of some unknown gas or vapour. Mars is still more peculiar, and enough is ascertained to discountenance the notion of his redness being due to a peculiarity of the soil.

"To aid researches into the condition of celestial bodies, the new powers of light, discovered by Niepce, Daguerre, and Talbot, have been employed by Bond, Draper, De la Rue, and other astronomers. To our countryman, in particular, belongs the honour of successful experiments on the rose-coloured flames which extend from certain points of the sun's border during an eclipse; as well as of valuable contributions through the same agency to that enlarged survey of the physical aspect of the moon, which, since 1852, the Association has striven to promote. By another application of the same beautiful art, in connexion with clock-work, the momentary changes of magnetic force and direction, the variations of temperature, the fluctuations of atmospheric pressure, the force of the wind, the fall of rain, the proportion of ozone in the air, are registered in our observatories; and thus the inventions of Ronalds and his successors have engaged the solar rays in measuring and comparing contemporaneous phenomena of the same order over large parts of the globe—phenomena some of which are occasioned by those very rays."

The magnesium light was one of the most popular attractions of the meeting. Mr. White's paper, illustrated with transparencies of the negatives recently taken by its aid, by Professor C. Piazzi Smyth, of the interior of the Pyramids, was listened to with great attention. The pictures fully illustrated the great difficulty experienced from the smoke of the burning metal and the want of ventilation in the tomb of the Pharaohs. The magnesium wire burnt languidly in consequence of the absence of oxygen, and clouds of smoke remained for many hours. In connexion with this subject we are glad to learn that Mr. Hart has lately invented a lamp which will effectually consume the smoke generated by combustion. On Monday night several balloons, to which the magnesium light was attached, were sent up and illuminated the country for miles. The light was also shown at the *conversazione* at the Town Hall on Monday evening, and in various parts of the town.

The *conversazione* repaid the photographer for the lack of photographic matter in the sections, and was full of interest, many illustrations of processes and appliances being exhibited. M. Joubert had a case of fine examples of his enamelling process, in which he has made important improvements. There were also exhibited, by Messrs. Roberts, Dale & Co., some specimens of enamels by M. Obernetter, of Dresden, apparently by a similar process to that of M. Joubert. Dr. Maddox's photo-micrographs were exhibited by aid of the magic-lantern in a separate room. Transparencies and prints on paper of the same objects were also shown on stands; and Mr. Skaife was busy taking pistolgrams by aid of the magnesium light. Mr. Breese's magnificent stereographs attracted a crowd of admirers. The Pantascopic Company sent some splendid panoramic views of Swiss scenery, by Braun, which were remarkable for a wonderful delicacy and atmosphere, but which were not quite free from the defect of the apparent presence of two sources of illumination. Mr. Swan exhibited some carbon prints; and Mr. A. G. Grant contributed a collection of photographs taken in a lead-mine.

As having some bearing on photography, we should mention as exhibited a case of the materials used in the manufacture of Parkesine, a new substance important to photographers as having collodion as one of its chief constituents, and which will probably be the material of which many photographic implements will in future be made.

Many other objects of interest, but not connected with photography, were exhibited, amongst which were a large number of microscopes and objects, immense solid projectiles and shells, and some curious human bones found in the limestone formation of the Great Ormes Head, Llandudno. But the exhibition which appeared to cause the greatest amount of interest and amusement was a lecture, or series of lectures, illustrated by some remarkable diagrams, on what the author, Mr. F. Wilson, terms "Formative Metaphysics or Mathematical Morality," and with which the lecturer (who appeared to possess immense comic powers as well as real genius) kept his audience (which consisted of all who could get within hearing by a tight process of packing) in roars of laughter, which must have been a relief to many who had worked hard in the sections during the week. The lecturer, whether in jest or earnest, did more towards the bemusing of the members of the British Association than did Charles the Second the *savans* of the Royal Society when he proposed to them the famous problem of the fish and the vessel of water.

Moving Photographic Figures.—Illustrating some Phenomena of Vision connected with the combination of the Stereoscope and the Phenakisticope by means of Photography. By A. Claudet, Esq., F.R.S.

[Read at the Meeting of the British Association, September 1865.]

From the beginning of photography it must have struck many of those who were acquainted with the phenomenon illustrated by the Phenakisticope invented by Plateau, that photography could produce with advantage the series of pictures used in that instrument, on account of their possessing a greater degree of accuracy than when made by hand. At a later period, when the stereoscope had become popular from its application to photography, there must have been a still stronger incitement to make use of that process to produce binocular pictures for the Phenakisticope, in order to combine the stereoscopic effect with the illusion of moving figures elicited in the Phenakisticope. For example: if a number of binocular photographic pictures were taken of a machine in various consecutive stages of its motion, these pictures, applied to a Phenakisticope, would give a complete illusion of the machine in perfect relief and in its full action.

Binocular pictures of persons dancing, fencing, or boxing, of acrobats at their wonderful feats, of boys playing at different games, all in the various stages of the action of each sport, representing consecutively the whole performance—such pictures might have been supposed to be invaluable to exhibit the stereoscopic illusion of persons in the real action of life. Therefore, the solution of such an interesting problem was capable of exerting the emulation and the ambition of many ingenious and scientific minds.

Among those who undertook the task, M. Duboscq, the eminent optician of Paris, was the one who attained the greatest success. He had fixed the two series of binocular phototographs on two zones of the revolving disk of the Phenakisticope one above the other, and, by means of two small mirrors, placed each respectively at the inclination capable of reflecting the two zones, on the same horizontal line, from whence the images could each separately meet the axes of each of the two prismatic lenses of the stereoscope. In this manner, during the revolution of the disk each eye had separately the perception of one of the series of photographs, each showing the perspective of one eye, and the stereoscopic effect of figures in motion was consequent.

M. Duboscq gave another form to the Phenakisticope. Instead of the vertical original revolving disk of Plateau, he employed a cylinder revolving on its vertical axis, and he placed on two inside zones of that cylinder, one above the other, the two series of photographic pictures between the slits through which the eyes can see the pictures, and by means of two mirrors, as in the other apparatus, each series was reflected on its respective lens through the cylinder, and the stereoscopic effect was produced in combination with the phenakisticopic effect.

However, these two attempts of M. Duboscq did present a few imperfections, which we are going to explain. In the revolving disk the two series of pictures do not move with the same velocity, on account of their being placed on two zones of different peripheries, and this produces a sort of confusion and distortion in the representation of the object during its movement. The same defect exists in Plateau's Phenakisticope in the perception of its single series; for the top and bottom parts of the figures, owing to the cause explained, revolving in different velocities, are not impressed on the retinæ during the same time, and the blank spaces between the pictures, being larger for the top than for the bottom part, give a stronger sensation of void during the visual perception of the pictures.

In the revolving cylinder this defect does not occur; but the picture, being considerably curved like the cylinder, is a most unfavourable disposition for examining them in the stereoscope. However, M. Duboscq's contrivances are very ingenious, and in his attempt he has succeeded at all events in proving the possibility of solving the problem.

About that time I had also turned my attention to the subject, and found some difficulty in obtaining at once the phenakisticopic and the stereoscopic effects, in avoiding the defects I have alluded to. However, as I am far from considering the case to be quite desperate, I intend to resume my researches as soon as I have leisure to do so. What gives me some hopes of success is the attempt I made years ago. The result has been incomplete and imperfect, but if I have not succeeded in obtaining at once the motion and relief, I have gone so far as to show figures which appear really to be in motion, and preserving all the correctness and distinctness of the photographs.

My ambition to obtain the stereoscopic effect with the movement of the figures having (I hoped only momentarily) been foiled, and not being satisfied with partial success, I did not like to publish an incomplete attempt, and for this reason, till now, kept it only for the curiosity of a few intimate scientific friends. But years are passing away swiftly, and as I do not feel at my period of life that I can reckon upon endless time and inexhaustible activity to complete many labours, I did not like to let another meeting of the British Association pass without availing myself of the opportunity of bringing before this annual scientific congress a very simple contrivance which, if I do not later succeed in solving the whole problem, will at all events, perhaps, call the attention of others to the subject, and induce them to try their hands and brains at its solution.

This is one of the many instances of the advantages of the British Association. Once a year all the branches of science of the world are brought together to show the progress made, and point out the progress to be made. All the devoted followers of those sciences consider that they are obliged to contribute their mite, however small it may be, to increase the general interest of the meeting, and to awaken the desire for further improvements and new discoveries.

As it will be seen by the instrument I submit to the meeting, it is very easy to obtain the illusion of moving figures, but without stereoscopic effect. In this instrument, my first object having been only to try the principle, I have constructed it in the simplest form capable of showing the motion of the figure, and I have found that only two pictures are sufficient to elicit the phenomenon, although the illusion of reality suffers from the abruptness of two extreme movements, and from the deficiency of intermediate positions.

But nothing is so easy as to employ eight different pictures in as many different stages of the action, and with this number of pictures the effect will be sufficiently complete. For this, having placed in the stereoscope two separate cubic frames, revolving independently on the same horizontal axis, I have only to fix on their four sides at right angles two sets of four pictures, making eight pictures, which are made to pass in consecutive order one after the other before the lenses of the instrument, and the figure will appear to assume consecutively eight different stages of the whole action. The instrument in its simple state, with only two pictures, will suffice to illustrate the principle, and, at the same time, to elicit some curious phenomena of the perception of vision.

It is known that the retina has the power of retaining for a short time the impression or the sensation of the image which has struck it. Now, availing myself of this property, I have constructed the instrument in such a manner that, by means of a slide with one hole, I can, by moving it rapidly in a reciprocating horizontal direction, shut one lens while the other remains open; and in continuing that motion, while one eye sees one of the two pictures, the second eye cannot see the other picture.

Now if, before the sensation of one eye is exhausted, the slide shuts the lens and opens the other, a new impression is produced on the retina, and we have an uninterrupted sensation of vision, as if the object had moved before us; and if a sufficient number of pictures represent that object in the various consecutive positions it has assumed during several stages of its motion, we experience on the retina the same sensation we have when we see the object itself while it is moving; and although the pictures in their limited number do not, and cannot, show all the intermediate positions of all the stages of a continuing action, still the mind has the power of filling up the deficiency, as it does if, when looking at a real object in motion, we accidentally wink the eyes, or an obstacle happens to pass before us and the object, although during that short interval we have lost the perception of a certain progress of the action, the mind has, as it were, guessed and represented to itself what ought to have taken place during the winking of the eyes, or during the intervention of the passing obstacle, and by that power of the mind there has been no interruption in the whole perception.

This is exemplified in the most forcible manner when we have only two pictures to look at alternately—one with the right and the other with the left eye, as it is with the instrument I have constructed for my experiment. One of the pictures represents the beginning of an action, and the other the end of the same action. By moving the slide one way the right eye can see the picture representing the figure in one position, and the picture showing the other position is invisible to the left eye. Now, by moving the slide the other way the left eye sees the figure in the second position, and the first position is invisible to the right eye. Now, although we have only seen the figure in two extreme positions, one showing the beginning of the action and the other its end, still we have had the illusion of having seen the intermediate positions.

This is fully illustrated by the pictures representing two boxers. In one picture the arms and fists of one of the pugilists are near his body, as if he were preparing to hit his opponent; and in the other picture they are extended in the act of striking the blow. We have not seen the intermediate positions which the boxer ought to have gradually assumed during the whole fight, but we know that they must have taken place, and our mind completes the action. This mental perception is due to the sensation which we expect from habit and judgment, and we feel it as if it had been truly realized.

Another curious phenomenon is elicited by the alternate vision of the two eyes consecutively. We see the object without any difference or interruption, whether it is by the right or by the left eye. The ultimate sensation on the mind is the same from whatever eye it has been carried to the sensorium of vision. Whether the object be seen by the right or by the left eye the sensation is exactly the same, and we cannot even distinguish which is the eye that has had the perception; so that if, while we have both eyes open, an object is passing before us, or if we move the hand before the eyes in such a manner that it hides alternately the vision of one and of the other eye, we do not feel that the vision is passing from one eye to the other, and it is impossible to know by which eye we have had the perception.

This explains the reason why in the instrument I have constructed, which alternately shows a picture in one position to one eye, and a different picture in another position to the other eye, we have a single perception of an object in motion without being conscious that the two actions have been consecutively and separately perceived only by one eye at a time, and in turn by one and then by the other. The result is an uninterrupted perception of an object in motion.

Our sensation of vision is not in the eyes but only in the single sensorium of vision, to which both eyes convey their separate perception. We have an example of a similar physiological fact in the sense of hearing. Although we receive the sound from two organs in opposite directions, only one perception is felt by the mind: the two sensations, like two drops of water the moment they reach each other, are resolved into one.

If I have encroached too much on the time of the meeting, I have to offer an excuse, which I hope will be kindly accepted. How is it possible to be short when one principle of science irresistibly leads us to another? And how can we stop when we begin to unfold the marvellous and innumerable expedients which the Creator has employed to make our senses perfect, and to help our intellect?

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Recent Applications of Magnesium.

By W. White.

A Paper read before the British Association, Birmingham, September 1865.

Last year magnesium was introduced to commerce; and since its introduction several attempts have been made to convert it from an article of curiosity and amusement into one of utility.

At Bath, last autumn, we brought it in wire, and blinded ourselves and dazzled our friends with its brilliant light. Shortly after, it was discovered that combustion was improved by flattening the wire into ribbon; and ribbon has almost superseded wire in the shops.

Magnesium so far has almost exclusively been regarded as a source of light, and the problem has been, how to burn it to the best advantage.

Assuming that wire or ribbon was the best form, the question narrowed itself to the contrivance of some apparatus, which would pay it out at the precise rate of combustion.

Invention moves by easy steps. The first attempts were made by Mr. William Mather, of Salford, and Mr. F. W. Hart, of Kingsland, who each produced a lamp in which the wire was delivered by hand from a reel, and guided through rollers and a tube to the flame of a spirit-lamp, in order to avert the risk of extinction. To this lamp Mr. Alonzo Grant, an American, affixed clockwork; and with this addition it has met with considerable success.

The risk of sudden extinction was a chief difficulty in the early use of the magnesium light, probably arising from some flaw in the wire—the presence of some foreign matter in its substance. As the manufacture has improved, and the wire assumed a degree of ductility unknown in samples a year ago, this difficulty has become greatly reduced, and especially in the case of the ribbon, which I have seen burn steadily for half-an-hour without sign of intermission. Perfect certainty of combustion (dispensing with the spirit-lamp) has been ensured by the use of a double strand of wire or ribbon—it being exceedingly improbable that the flame of both should go out at the same instant, and in the event of one being extinguished, it would be re-lit by the other. One of Grant's lamps paying out a double strand has burned for two hours without cessation; and it is only necessary that the reels of magnesium and the clockwork be enlarged to secure a continuous light for any requisite time.

Captain Bamber, R.N., of Clarence House, Jersey, has been making a variety of experiments in order to adapt magnesium to common use in mines, tunnels, and railways. His instrument consists of a mahogany box, about eighteen inches long, containing a series of small wheels (much resembling those of a musical box), and a drum, round which the wire is wound, and from which the burner is supplied at a rate proportionate to the revolution of the drum, whose action is governed by a regulator. The burner is enclosed by a powerful lens, or "bull's eye." Captain Bamber exhibited this instrument one night lately at the

Paddington Railway Station, and though the thinnest ribbon manufactured was used, the time was easily read off a watch at the distance of 250 yards.

There is manifestly much more to be accomplished in the matter of lamps. We require apparatus whereby a hall or picture-gallery can be illuminated for the evening. This, one would say, should be effected by burning the magnesium overhead from the centre of the ceiling; but the disposal of the smoke and ash, consisting of pure magnesia, is the difficulty —a difficulty however which has only to be stated to be met and overcome. Already some ingenious mechanics are tackling it hopefully.

It is a question whether magnesium in filings has met with due attention. It would not be difficult to deliver a stream of metal as sand from an hour-glass into a jet of gas or other flame, and thus maintain a light with a certainty equal to that obtained by wire and clockwork.

"A very curious and beautiful light; but what is the good of it?" asks the practical man. As Franklin met a similar question in the case of electricity, "What is the good of a baby?" Magnesium is a baby, yet though a baby it has already given some pledges of its manhood. One of its first feats was taking a number of portraits at night with a precision and effect equal to sunlight. This done, it was at once suggested, Why may we not have photographs of caves, catacombs, crypts, mines, and of every dark and wonderful cavity?

One of the first to put this suggestion to the test was the Scottish Astronomer Royal. Probably all have heard something of the interesting controversy connected with the granite coffer—the *sanctum sanctorum* of the Great Pyramid. It was Professor Piazzi Smyth's great object to bring this mysterious coffer to light, and to dissipate for ever all uncertainty about it. This, with the aid of magnesium, he has accomplished. We shall shortly have a volume from his pen descriptive of his researches and conclusions, and illustrated with photographs. Meanwhile he has most kindly allowed copies of his photographs to be exhibited to the Association, and has favoured me with a few notes concerning them which I shall now read.

"1st. The interior of the Great Pyramid did not prove a good space for developing the excellences of the magnesium light. The ventilating-passages opened by Colonel Howard Vyse in 1837 have been completely stopped up with stones and sand by the Arabs. Hence the air in the interior of the Pyramid has no visible means of being changed or purified; and as the said interior is visited every day through six months in the year by numerous parties of visitors bearing candles, the oxygen is so deficient, and the carbonic acid so abundant, that my surprise is that the magnesium burnt at all. It did burn, but in a languid sort of way, and the smoke it threw off remained suspended in the motionless air for twenty hours or more, so that only one picture could be taken in twenty-four hours. If a second was attempted, the illuminated smoky air intervening between the camera and the object desired to be pictured was the only result on the photographic plate.

"2nd. My object was not pictorial or artistic photography (of which I have therefore nothing to show), but the application of photography to certain disputed and special parts of the interior of the Pyramid for the sake of scientific examination and measurement; and these objects *were* obtained, notwithstanding all the drawbacks of the place, which really seemed combined to frustrate the merit of the light.

"3rd. One example of success is presented in the granite coffer in the King's Chamber of the Great Pyramid. According to the theory of the late Mr. Taylor, that coffer was a primeval measure of capacity, from whence is derived the the hereditary Anglo-Saxon wheat-measure called the quarter, of which coffer it is the fourth part. Whilst, however, we know by Act of Parliament how many cubic inches are contained in four quarters English, there has been much doubt as to the cubical contents of the granite chest of the Pyramid. The measures of the French Academy in 1799 made it nearly 6300 cubic inches greater than several English travellers had declared it to be, though they again by no means agreed with each other in subsidiary details. Now, however, by means of the magnesium light, we have a series of photographs of this coffer, with a system of measuring-rods fastened about it[*], showing the size inside and the size outside; and, finally, the cubical contents being summed up prove that the remarkable granite vessel *is* a measure of capacity equal with almost mathematical accuracy to four quarters English."

A peculiarity of the magnesium light is, that it leaves colours unaffected—that is, it displays them as in sunshine. This may be verified with agreeable effect by burning a piece of wire at night in a garden or conservatory, when it will be found that greens and blues, yellows and whites, reds, violets, and purples appear with perfect distinctness. This fortunate quality has led to the employment of the light by dyers and silk mercers as a ready means of settling questions as to shades of colour either at night or in foggy weather.

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[*] The application of the measuring-rods was a happy idea worked out by Joseph Sidebottom, Esq., of Manchester. He supplied Prof. Piazzi Smyth with some large slices of an old organ-pipe of Queen Anne's time, as the most unexceptionable stuff—thoroughly seasoned wood—wherewith to make trustworthy scales.

A variety of magnesium alloys has been made, but none so far with any obvious excellence. Some experimentalists have had trouble in preventing the combustion of the molten magnesium. An easy way of getting over this difficulty is by first melting (say) the copper, and then, with pincers or otherwise, holding the pieces of magnesium underneath its surface until it is dissolved. By practised and dexterous handling, molten magnesium is safely managed in closed vessels; but any one may try his hand at alloys by the method described.

An alloy of lead and magnesium burns very well; but the best combustible result is obtained by the combination of zinc and magnesium. Alloys with zinc in the proportion of 5, 10, 15, and 20 per cent. are readily converted into wire, and burn steadily, giving out more smoke, however, and the light exhibiting less actinic power.

For common pyrotechnic purposes, these combinations of zinc and magnesium promise admirably: reduced to powder, they supply a brilliant ingredient for rockets; and in the shape of wire, they form a simple and efficient fire-work, cheaper, if less dazzling, than magnesium alone, and quite worthy of Guy Fawkes's day.

To the utilization of magnesium no one has brought such experience and such resources as Captain Bolton. As is well known, he devised the oxy-hydrogen signal-apparatus introduced to H. M.'s service some three years ago. The credit attached to this success would have tempted many a man into the position of an obstructive; but Captain Bolton having arrived at the conviction, based upon actual experiment, that the magnesium light possessed all the necessary attributes for a perfect naval and military signal light, equally with the electric and lime light, and with decided superiority over them in the grand requisite of handiness, he at once avowed his conviction, and set to work to apply its powers to the best advantage.

In the first place, in conjunction with Captain Colomb, he has succeeded in introducing magnesium powder into signal-lights for use in the mercantile marine. These lights are intended to burn on the port or starboard sides of vessels entering port during thick or foggy weather. They last 3, 5, or 8 minutes, and longer lights from 12 to 15, and are distinctly visible at a distance of eight miles. The cost is trifling.

The Mercantile Marine Association of Liverpool have lately recommended that a powerful red light be made as the signal for danger at night. This recommendation Captain Bolton and Captain Colomb have met, again by the use of magnesium in powder. They have prepared a red light to burn about 15 minutes at a cost of 1*s*. 6*d*. It is visible in clear weather at a distance of ten miles. The signal is now under consideration by the Association.

A greater interest, however, belongs to Captain Bolton's efforts to supersede the oxy-hydrogen light by the combustion of magnesium in simplicity, in wire or ribbon. His apparatus for this purpose is not yet complete, and until it is, it would be unfair to him to prejudice it by description. Suffice it to say, that he has succeeded in consuming or suppressing the smoke, and with a few more adjustments will accomplish clipping off the ash which gathers on the point of the burning strand of magnesium, and sadly dims its glory.

With all imperfections, Captain Bolton has found it easy to signal with magnesium from Shoeburyness to the "Great Eastern" eight miles off; and from Portsmouth to St. Catherine's Downs, Isle of Wight, a distance of sixteen miles.

Supposing Captain Bolton should fully attain what he proposes, it will lead to the employment of magnesium in all the ships and lighthouses of Europe. Rid magnesium of its smoke and ash, and there is no light to compare with it in other respects.

The manufacture of magnesium has been commenced in Boston, and from the men of Massachusetts, who are said as babies to lie awake and scheme improvements and patents in the construction of cradles, we are likely to hear of some novel applications of the metal. If the contest in which they were engaged had not so happily ended, we should have learned ere this a good deal about the utility of magnesium in war. We were startled in reading last February, in 'The Times' and other papers, that blockade-running was about to receive an unexpected check, for it had been found possible to remove the veil of night by the blaze of magnesium fire. In a rough way it may be said, that to us in England novelty is a prejudice to be overcome, but to Americans novelty is a recommendation.

All our talk has been of magnesium as a source of light, but surely it will be found capable of other applications. It is, perhaps, the most abundant metal in nature. It rolls in the sea, and forms vast tracts of land. If, as some say, everything in creation bears reference to man and was designed for his use, what a future there is for magnesium! Sir

Humphry Davy was the first to give the hint of its existence, nearly sixty years ago: it is time that Birmingham converted that hint to practical purpose.

NORTH-EASTERN LONDON EXHIBITION.

Report of the Jurors of the Photographic Department.

In presenting a Report of their labours in the Photographic Department of this Exhibition, the Jurors have much pleasure in noting the great excellence of the majority of the contributions. In some departments the uniformity of this excellence rendered the task of deciding upon the highest merit one which required much deliberation, and the Jurors will feel it necessary, in stating their reasons for their awards, to qualify in some instances the degree of merit which they represent.

The following Medals have been awarded:—

For the best Portraits, Mr. E. W. Foxlee.

For the best Landscapes, Mr. F. Bedford.

For the best Pictures from Dry-plate negatives, Mr. J. Mudd.

For the best Enlargements, no award.

For the most Artistic Pictures, no award.

For the best Instantaneous Pictures, Mr. V. Blanchard.

For the most important Invention, Mr. W. B. Woodbury.

For the best Camera, Mr. Meagher.

For great excellence in Lenses .... { Mr. Dallmeyer. Mr. Ross.

In deciding upon the award for the best portraits, the Jurors had to distinguish between various degrees of excellence possessed by many highly meritorious contributions. The portraits by Mr. Foxlee, by Mr. Jeffreys, by Mr. Rejlander, by Mr. Whaite, by Messrs. Maull and Co., by Mr. Downer, and some others, all presented distinct points of merit, and were worthy of very high commendation. Some of the contributions just named possess qualities of a higher artistic order than the pictures to which the Medal was finally awarded; but, in estimating the degree of merit in portraiture, the Jurors felt that the size of the pictures and the degree of technical photographic excellence attained were considerations which, in an Exhibition of this kind, demanded attention; and, in estimating the aggregate of good photographic qualities, it was decided by a majority of the Jurors that this Medal should be given to Mr. Foxlee.

In determining upon the best landscapes the Jurors had not much hesitation. With the exception of those of Mr. England and those of Mr. Mudd, which claimed consideration on other grounds, there were no other landscapes, notwithstanding a goodly number of fine pictures contributed, which could compare with those of Mr. Bedford in all the qualities which constitute good landscape-photography.

In awarding the Medal for the best pictures from dry plates, the Jurors had a very simple duty to perform, as there was practically no competition, the few other pictures from dry plate negatives by the tannin and other modern processes bearing no comparison whatever with the pictures of Mr. Mudd by the collodio-albumen process, which is the oldest dry process in existence.

A great variety of enlargements, but few of any excellence, were contributed to this Exhibition; none were considered by the Jurors sufficiently perfect to warrant them in awarding a Medal. Difficulties of this kind were felt. One contributor, Mr. Smith, who exhibited a large bust of some brilliancy, tolerable modelling and definition, also exhibited several others which were wanting in these qualities. Several other examples of enlargement, having fair average excellence, were found, when they came under the attention of the Jurors, to be exhibited, not by producers, but by agents or dealers, and were thus disqualified for receiving attention. Perhaps the greatest amount of general excellence was to be found in the numerous specimens of Mr. E. Aldis, produced by the aid of artificial light; but these did not reach a standard of excellence sufficiently high in the estimation of the Jury to receive the reward of a Medal.

In considering the award of the Medal for the most artistic picture or pictures, the Jurors were placed in a position which left them but little option in arriving at a decision. It was felt by the whole of the Jurors, with the exception of one (who, from the circumstances of the case, could offer no opinion), that the compositions of Mr. H. P. Robinson were the most artistic pictures in the Exhibition; but these were exhibited by one of the Jurors, and marked "not for competition". It was formally proposed, therefore, by the Chairman, and agreed to—

"That the Medal for the most artistic picture or pictures should not be awarded, inasmuch as, of the pictures exhibited, those by Mr. H. P. Robinson unquestionably claimed the highest artistic position; and being marked 'not for competition,' as the work of a Juror, they were ineligible for an award; the Jurors would therefore somewhat stultify themselves if they gave the Medal to any inferior pictures."

A Medal for artistic excellence being thus placed at the disposal of the Jury, it was suggested that a very important branch of the art, especially allied with its art-aspects, had not received consideration in the original offer of the Medals, instantaneous photography having been entirely overlooked. The fine instantaneous stereographs of Mr. V. Blanchard, illustrating almost every phase of excellence in that difficult branch of photography, had however strongly impressed themselves upon the attention of the Jurors whilst examining the contributions. It was felt, therefore, that there would be a great fitness in transferring the Medal for the most artistic pictures to the best instantaneous pictures; and Mr. V. Blanchard received an unanimous award.

The next Medal which the Jurors had to consider was for an undefined object, having been left open with an especial view to give a discretionary power to the Jurors of rewarding any discovery, invention, or meritorious novelty, examples of which might be contributed to the Exhibition. The Jurors were here again placed in a dilemma by the fact that one of their number had contributed illustrations of a most important discovery, which he had recently given to the photographic world. They refer to the collodio-chloride process of Mr. G. Wharton Simpson. They felt generally that a process of this kind should claim their first attention in awarding this Medal. The recognized disqualification of the works of a Juror for receiving an award compelled a disregard of the claims of this process; and the examples of photo-relievo printing by Mr. Walter Woodbury, although wanting in certain perfections of finish incident to the infancy of the process, presented so much promise of important economic value and a future pictorial excellence, that it was unanimously felt that Mr. Woodbury had merited a Medal.

In their examination of cameras and other Photographic cabinet-work, the Jurors have to note the results of a high degree of skill, care, and enterprise*. Nothing could surpass the excellence of the workmanship of Messrs. Ottewill, Collis and Co. Scarcely inferior was that of Mr. Hare. But in their early deliberations the Jurors had arrived at a conclusion that excellence of design and especial fitness for the necessities of the photographer, when in combination with good material and first-rate workmanship, would be most equitably rewarded with the distinction they had to confer; and it was for excellence of design, especially in combination with other good qualities, that the Medal was given to Mr. Meagher Preeminent as possessing the quality referred to, was a portable camera with folding tail-board, packing into small space, and, being light as well as strong, permitting the use of lenses of very short as well as of long focus without inconvenience, being readily adaptable to various purposes, without any sacrifice in convenience and suitability for its primary intention—a fault too common with cameras of the *multum in parvo* order. This Camera may be used for taking a pair of stereoscopic pictures, for taking a pair of card portraits, or for one cabinet picture of 7½ × 5. The focusing screen is hinged, instead of detached; the shutter of the dark slide opens laterally instead of vertically, effectually protecting the plate from the entrance of light through the grooves of the shutter; whilst great rigidity and strength are combined with portability and lightness. Some of the cameras exhibited by other makers possessed many of the characteristics, but the most satisfactory combination of them was found, in the opinion of the majority of the Jurors, in the camera just described.

In awarding a Medal for the best lenses, the Jurors had to consider what was implied in the phrase. As photographic lenses are employed for such a variety of purposes, and the qualities valuable in one application are useless or mischievous in others, it was clear that the term could not be regarded in any absolute sense. It was resolved, therefore, that high general excellence and fitness for a variety of purposes would best merit the approbation of the Jurors. It was suggested, moreover, by the Chairman, that as the commercial productions of the competitors would not probably be superior to those especially prepared for competition, the practical experience of the Jurors with the lenses of the only two contributors would afford an excellent aid in coming to a decision, and might with great propriety, in this instance, influence them in making their award. An examination of the photographs contributed by each competitor as illustrations of the working of recently invented lenses was also very satisfactory. From a consideration, then, of the illustrative specimens exhibited, and of the practical experience possessed by the Jurors of the majority of the lenses in competition, it was decided that two Medals should be awarded, one to Mr. Dallmeyer and one to Mr. Ross, and each for great general excellence.

The Jurors cannot conclude their report

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* The Jurors have to remark that, in the choice of material for cameras, none of the contributors had kept entire pace with the progress of the market in supplying suitable materials; and they felt some surprise that a material so light, rigid, and free from the tendency to buckle or warp as the timber of a species of tulip-tree, known in the trade technically as "Canadian white wood," which has been found extremely valuable for coach-panels and similar purposes, was not to be found as applied to photographic cameras. On the authority of one of the Jurors technically versed in such matters, they throw out this suggestion to manufacturers.

without making a few observations on some of the most meritorious of the pictures exhibited.

Amongst many excellent contributions in portraiture, one by Messrs. Maull and Co. is especially worthy of notice, taken direct on a plate about 20 × 16. Notwithstanding some falling off at the corners, probably due to the imperfection of the lens, this picture, a portrait of a lady, possesses some of the highest qualities of portraiture; it is delicate, round, and brilliant, easy in *pose*, and agreeable in expression. The portraits by Mr. Jeffreys have, although not invariably, a general harmony, solidity, and freedom from vulgarity, highly to be commended. A number of large portraits of eminent men, by Mr. Whaite, of Manchester, possess great uniformity of excellence. The portraiture and studies of Mr. Rejlander, many of which in this Exhibition possess the merit of novelty, display so much freshness of feeling and artistic capacity that the absence in some instances of an equal degree of technical merit is the more to be regretted. Many of the portraits of Messrs. Southwell Brothers are worthy of commendation; pre-eminently so, two portraits of Shaksperian characters, on plates 22 × 18, possessing an amount of artistic arrangement and technical excellence rarely met with in pictures of such size. Surpassing some others in some points of artistic arrangement is a series of small pictures by Mr. R. W. Downer, of Watford. The taste and skill in arranging groups and the general feeling for pictorial effect exhibited in these pictures cannot be too highly commended.

As displaying excellence of intention and, in many instances, skill in execution, the Jurors would call attention to the compositions and studies of Messrs. Twyman, Blanchard, Cooper, and Dr. Hemphill.

Commendable for many excellent qualities in landscape-photography are the contributions of Mr. F. M. Good, D. W. Hill, Nelson K. Cherrill, and of Mr. Braun (who exhibits two very fine large panoramic alpine views taken with Johnson's pantoscopic camera).

Amongst novelties, especially noteworthy are some examples of printing in collodio-chloride of silver on opal glass, by Mr. Noel E. Fitch; and some admirable examples apparently by the same process, but not so described, by Mr. J. C. Leake. Mr. J. Stone exhibits two good examples of Swan's carbon process, and also two curious transparencies on paper produced by the action of light on gelatine and bichromate of potass.

In the Apparatus department a valuable collection of photographic vessels in vitreous ware and iron-stone, by Messrs. Edwards and Son, of Dale-Hall Potteries, Burslem, excellent in design and material, deserve the highest commendation. The cases of chemicals exhibited by Mr. How, Messrs. Johnson and Co., and by Messrs. Morson and Son, are well worthy of attention, as are also the fine examples of photographic glass exhibited by Mr. Goslett.

Hugh W. Diamond, M.D., *Chairman.*
G. Shadbolt.
W. Hislop.
G. Wharton Simpson.
H. P. Robinson, *Reporter.*

[*Note.*—A letter declining the Medal, purporting to be from Mr. Ross, has appeared in a contemporary. The Jury not having received any intimation from Mr. Ross to any such effect, we can only conclude that this letter has been published without his authority.—*Ed. Photo. Journ.*]

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New Method of Photo-relievo Printing.

By the courtesy of Mr. G. Wharton Simpson we had an opportunity, some days ago, of attending a meeting, at his private residence, of literary and scientific gentlemen, assembled to witness Mr. Woodbury's operations in the important new process he has invented. Mr. Woodbury's discovery promises to be one of the most useful that has yet been given to photography. His method has been so well described in the 'Photographic News,' that we extract the article referring to it:—

"A method of producing, by means of the printing-press, transcripts of photographic negatives with any approximation to delicacy, definition, detail, and true photographic half-tone, is a process which must interest every one, first by its elegance and ingenuity, and next with its economic importance. In our last, Mr. Walter Woodbury gave a succinct account of the method by which he is able to effect this object, and on Saturday last we had the pleasure, in company with about a dozen gentlemen distinguished in connexion with photography, art, and science, assembled for the purpose at our private residence, of witnessing the operations. Mr. Woodbury demonstrated, as far as improvised apparatus would permit, the method of securing impressions on paper and glass, by pressure only, from an intaglio plate, obtained by the processes described, by the aid of a photographic negative.

"It is not necessary here to enter into a detailed history of the process, or of its independent discovery by two gentlemen. We received the first intimation of such a discovery, in confidence, from Mr. J. W. Swan; and subsequently we learnt from Mr. Woodbury that he had been experimenting in the same direction. The latter gentleman informed us that he had obtained a patent, securing the principle in various applications; and he subsequently offered half the patent to Mr. Swan as an independent inventor, having equal moral rights as himself. By some unhappy misunderstanding this partnership of interests was not only not consummated, but the negociations, when terminated, left them with a mutual sense of injury. That part of the matter is now past, and it is not necessary to refer to it in further detail. It is somewhat curious to note, however, that whilst the idea appeared so novel and beautiful here, to every one to whom it was mentioned, M. Gaudin, when we first described the process, nearly twelve months ago, after giving a translation of our article, declared the principle to be as old as Aaron, and stated that he had experimented in a similar direction twenty years before. But there was this distinction between his experiments and those now under our attention. His was a method of printing with translucent ink from intaglio plates, *engraved by hand*. The application of the same idea to photography, as M. Gaudin remarked, might lead to important results. It is, indeed, in the photographic idea that the whole interest centres. The beauty of the idea consists in the possibility of getting an exact transcript of a negative in gradations of relief in a metal plate, and printing from that in gradations of thickness of a translucent ink.

"As we conceive the matter to be one of very great importance, we will repeat a portion of our statement of the principles involved, given in October 1864, in order that our readers may have the principles upon which this mode of printing is based clearly in view.

"There are five distinct modes of printing or multiplying, from a cliche, pictures or designs:—*Block-printing*, or the method of producing impressions by inking a block with raised surfaces, and obtaining a copy of such raised surfaces by pressure, upon paper or other fabric, as in wood engraving, &c. *Intaglio printing*, or the method of producing impressions by filling up with ink lines or hollows in a metal plate, the cleaning the surface and obtaining a copy of the lines and hollows by pressure, which causes the ink to be transferred to paper or other fabrics, as in copper-plate printing. *Lithographic printing*, or the method of producing impressions by applying ink to a design upon a stone, the design having an affinity for the ink, whilst the other portion of the surface repels the ink, the design so inked being obtained upon paper by pressure. *Photographic printing*, or the method of producing an image by the action of light through a negative, upon a surface which is darkened by the action of light. And *carbon printing*, or the method of producing an image by the action of light through a negative, upon a soluble substance which is rendered insoluble by the action of light, and so imprisoning any colouring-matter incorporated with it, and thus yielding a design in such colour.

"In each of the three first-named methods, gradation of tint is obtained on the same principle; the ink applied is opaque, and the thinnest, as well as the thickest, layer of it should be black. The gradation, or variation, in depth in the image is obtained by the design being formed of lines or dots: when the lines or dots are large and very close to each other, a very deep tint is produced; when they are fine and wide apart, a light tint is produced; an absence of either lines or dots to receive the ink leaves the paper white, and a continuous surface to receive the ink produces a breadth of black. But in no case is there gradation of tint in a continuous surface, or what is termed a flat tint. In photographic printing, gradation is obtained on a different principle: lines or dots, hatching and stippling, are unnecessary. The gradation is obtained by degrees of depth in a continuous tint, like 'washing,' in water-colour drawing. It is the nature of this gradation, and its dissimilarity from that employed in ordinary printing, which has been the great difficulty in obtaining successful press-photography.

"In carbon printing, gradation is obtained without lines or dots, as in ordinary photographic printing, but the method of securing that gradation is again essentially different. It is obtained here by different thicknesses of a coloured translucent material on a white ground. The deepest blacks consist of a sufficient thickness of this material to become practically opaque, and cover the white paper upon which it is fixed, without allowing it to show through; the next depth of tint is obtained by a slighter thickness, which allows a trace of white to show through, producing the effect of deep grey; the other tints by varying thicknesses, the thinner the layer of the coloured translucent medium, the more delicate the tint of grey, as the white ground becomes more and more apparent, gradually merging into the pure white of the ground as the layers become attenuated to nothing. This mode of securing gradation embodies a new principle which has been scarcely sufficiently recognized in treating of carbon printing, and it is of the utmost importance in the process we are about to describe.

"The new system of printing consists in a combination of the principle upon which intaglio or copper-plate printing is based, and that upon which the image in carbon printing is obtained. An image in which the shadows are in relief, and the whites depressed, is obtained by exposing bichromated gelatine under a suitable cliche to the action of light, and afterwards to water. The details of the process may be varied, but we need not enter into them here, as the principle is well known. From the gelatine an electrotype is obtained with the lights in relief, and the shadows depressed, as in an engraved copper-plate. This is the block or cliche from which impressions have now to be obtained by mechanical means. It must be borne in mind that the intaglio so obtained represents by degrees of depth the gradations of the image. This intaglio is now to be filled with a thick solution of gelatine, containing Indian ink, or other colouring-matter mixed with it; when slightly set, and the surface cleaned as in copper-plate printing, it is placed in contact with paper, the surface of which would be best prepared with gelatine, albumen, or collodion, to prevent it being absorbent; the block is then brought into firm contact by steady heavy pressure. The set gelatine and colour will be thus delivered on to the paper, much in the same way that the cook delivers a shape of jelly from its mould. The gelatine and colour so delivered on to the paper will in all respects resemble a carbon print. The deepest shadows will consist of a thick opaque layer forming blacks, each gradation from these to white consisting of a thinner layer of the translucent material.

"We have said that, in demonstrating on Saturday, Mr. Woodbury was confined to the use of improvised apparatus and material, his press, &c., from a misunderstanding, not having come to hand. A brief description, however, of these improvised arrangements may better aid those disposed to experiment in this direction, than would an account of the working of more perfect appliances. The intaglio plates, one in copper produced by electro-deposit, and one in type metal produced by pressure, Mr. Woodbury brought with him. The electrotype mould, which was most suited for printing on paper, was in tolerably deep intaglio, the greatest depressions being about the depth of a thin card, the whole presenting somewhat the effect of an engraved copper plate, but with less crisp or sharply cut lines. The type-metal *cliche* was much less deeply impressed, and was prepared with a view to printing on glass. In order to print, a little gelatine was just covered with water for a few hours; when the gelatine had thoroughly imbibed the water, it was melted by heat, and a little of the prepared Indian ink used for carbon printing added and mixed. A little of this gelatine, kept in a fluid state by warmth, was poured on to the centre of the intaglio mould, covering about one-eighth of its surface. A piece of fine, hard photographic paper was placed on the gelatine, and a stout piece of plate-glass was then laid on the paper. In the absence of a press, a twenty-eight pound weight was then placed on the glass, and left for a minute or two to allow the gelatine to set. The pressure was then removed, and the print lifted up; the gelatine slightly set, leaving the intaglio as jelly delivers from a mould, and adhering to the paper, giving a print in varied gradations, just in proportion to the thickness of the layer of coloured gelatine. After taking a few impressions it is found desirable now and then to slightly grease the mould to insure the print delivering perfectly without adhering or leaving any of the coloured gelatine behind. We learnt from the experiment we saw that some samples of gelatine are not well suited to the purpose of printing. That which we had in stock had the peculiarity of setting very imperfectly, continuing for a long time fluid, and had consequently a tendency to leave the mould imperfectly. This, with the unequal and imperfect pressure, caused the results of the operation to be less satisfactory, pictorially, than other prints produced with other materials from the same mould; but they admirably illustrated the principles involved.

"Although Mr. Woodbury has made considerable progress, and attained some excellent results, there is doubtless still something to learn in such a process, and still higher results to be gained. At present some uncertainties seem to exist as to the absolutely best method of obtaining the intaglio mould. Mr. Woodbury, as those of our readers who have carefully studied his communication in our pages last week know, uses a film of gelatine and bichromate of ammonia not perfectly desiccated, supported by a sheet of talc, which is in contact with the negative, the whole placed in the cone of rays formed by a large condensing lens. Whether from the intervention of the sheet of talc, or the slight divergence from parallelism of the rays passing through the negative, or from other causes yet to be noted, it appears that sometimes there is slightly less sharpness in the metal intaglio than is to be found in the negative. Mr. Swan we know attaches great importance to the advantages of adding a little colour to the gelatine in order to control the action of light; he also prefers to use a dry film, and to print by superposition. He obtains thus somewhat less relief, but he believes that more sharpness is also secured. Mr. Swan prefers the slight relief; Mr. Woodbury, who has worked out the printing details carefully, and somewhat extensively, says that good results cannot be obtained on paper with low relief, inasmuch as the inequalities of the surface of paper play an important part in spoiling an image obtained by pressure in this way when the relief is very low. Another cause at times of imperfect sharpness arises from the tendency in the gelatine mould to swell on being placed in the solution of sulphate of copper for procuring an electrotype, and thus slightly marring the crispness of the finer lines. This, as J. Trail Taylor suggested, might possibly be somewhat obviated by employing a solution of cyanide of copper, which being alkaline would act less readily on the gelatine than an acid solution, and probably improve the result. The system of obtaining an impression in a soft metal by pressure already gives sharper results than the electrotype, and it may possibly be found with improved appliances to give perfect results.

"As we have already stated, a considerable degree of excellence has even now in the infancy of the process been obtained, and we are very sanguine that results will shortly be secured which will give the process an immediate practical economic value wherever large numbers are required. Mr. Woodbury thinks that with three or four presses going, which could easily be worked by one person, the prints could be produced at the rate of about one hundred and twenty per hour. It will be readily seen that in this respect this method might compete without much disadvantage with copper-plate printing. If, instead of merely using an ordinary water colour in combination with the gelatine, a vitreous colour were employed, we have a ready means of producing a print in enamel colour which, transferred to glass or china vessels, might be burnt in without difficulty. Other pictorial and decorative applications will readily suggest themselves as the process comes into use, increasing its value and interest. We may here remark that many of our readers will have an opportunity of forming some notion of the present progress, by examining the transparencies on opal glass which Mr. Woodbury now exhibits at the North London Exhibition, as well as the intaglio in electro-type and type-metal with prints therefrom, also shown at the Agricultural Hall.

"Another application of the same principle, and that to which we believe Mr. Woodbury, at the outset of his experiments, attached the most importance, is the production of transparencies in porcelain, the image being produced by the various degrees of relief, and, consequently, in semi-transparent material, in degrees of transparency or opacity. From the intaglio moulds already described it will be seen, such images in porcelain could be easily produced. In a conversation, a day or two ago, with Mr. Adams, of the firm of Edwards & Son, of Dalehall Potteries, we learn that the production of such transparencies is an important branch of their manufactures, a large market for such articles being found on the Continent. At present an important item in the cost is the employment of skilled artists in preparing the moulds by hand labour. The employment of a photographic operation, such as we have described, would enormously decrease this cost, and would necessarily confer increased value in the beauty and detail, as well as in the interest attaching to the results."

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The Legitimacy of Combination-Printing.

We had thought that the question, "Is combination-photography legitimate?" had been definitely settled, but the subject has again recurred. In a paper read before the Photographic Society of Scotland, Mr. Slight has argued that composition-photography is untrue to nature. His paper has produced an admirable answer from a correspondent to the *Photographic News* who sign himself "Respice Finem," which not only gives the substance of Mr. Slight's paper, but something more than an answer at the same time. We reprint the letter:

Sir,—The sage apothegm of the venerable and oft-quoted Mrs. Glasse suggests, as a preliminary to the preparation of jugged hare, "First catch your hare." Other and less practical philosophers might suggest, as a still further preliminary, a careful study of the game laws, an examination of the question concerning public property in *feræ naturæ*, and of the abstract right of any one to preserve game. I am led to these reflections by a perusal of two articles I have recently read, both concerning art-photography. I had just finished Mr. H. P. Robinson's admirable article "On the Selection and Management of a Subject." I had been charmed with the comprehensive and practical treatment and lucid style of the article, so free from vague rhapsody and the parroting of the jargon of art. In short, I had learnt something definite from it. Whilst the writer had, with characteristic modesty, avoided all allusion to his own works by way of example, and had not mentioned what has been, foolishly enough, distinguished as "composition-photography," I could not help recalling many of his beautiful compositions to mind as I read the article. I remembered that Mr. Robinson was not only the apostle and practical exponent of "composition-photography," but at one time risked becoming its proto-martyr, when it was designated the "patchwork" heresy. I thought, however, that the said heresy had, like many other heresies, finally been acknowledged as truth, and was now, amongst photographers generally, including even former opponents, regarded as sound doctrine.

I had just, as I have said, concluded reading this article, and had been revolving those ideas in my mind, when I took up another journal, and read a paper which had been brought before the Edinburgh Society by Mr. Slight, and which was entitled "Concerning Art-Photography." In this paper I found all the arguments against "composition" or combination revived, as though they had been never discussed or exploded. Let me here remark, that I should be sorry to say one word which might seem disrespectful to Mr. Slight, whom I have not the happiness to know, but who is, I doubt not, a very worthy gentleman. His paper contains a calm and fair expression of certain opinions, and it is with these and their soundness, or the contrary, that I am concerned. I hope it is possible, amongst photographers, to differ in opinion without entering into personal quarrels. Well, Mr. Slight's opinions appear to me to be erroneous, and calculated to retard the progress of our art. If Mr. Robinson's paper was practical, and gave an excellent recipe for cooking my figurative hare, Mr. Slight's stopped me at the threshold of my operations by insinuating, that, in catching the hare, I should be poaching, and that, moreover, it would prove very unsatisfactory food.

To drop the metaphor, Mr. Slight urges against "composition-photography" that it is untrue. His arguments bring us back to a point which I had imagined was, amongst photographers at least, definitely settled, namely the sphere and scope of photography in pictorial art. The general subject is a wide one, but a discussion of Mr. Slight's objections to "composition" will pretty well cover the general principles involved in the larger question. His first objection is on the score of fitness. He says, that a statue carved in ice, however skilfully done, would offend, rather than please, because of the want of a sense of fitness in the material for rendering of sculptured forms. The argument here, so far as it is derived from the unfitness of the material, at once falls to the ground, because the material upon which the photograph is produced is the same as that of which an engraving is printed. But I apprehend that the illustration is chiefly meant to imply that unfitness may destroy the value of otherwise good work, and thus bear on the argument which follows, to the effect that the universally received notion of the absolute truthfulness of photography unfits it for the rendering of any pictorial grouping, which is due to the arrangement or composition of the artist, whilst the less truthful character of the painting permits it to be employed in giving embodiment to any idea the artist may conceive, whether it have a real existence or not. Photography, in short, is to be confined to the rendering of facts as they are, whilst painting may render facts as they might be. I will, however, in order to be exact, give Mr. Slight's argument in his own words:—

"This wonderful and almost unavoidable power of truthfulness to nature we are getting so accustomed to, as to almost lose sight of its belonging peculiarly to photography. But it is certain that this constitutes its greatest charm: for, however inartistic a photograph of natural scenery may be, we have at once, on looking at it, a feeling that it is at least true. . . . . . It would thus appear that the great peculiarity or key-note of photography is truthfulness."

This truthfulness, Mr. Slight thinks, may not only be dispensed with, but is unattainable in painting. He says:—"In the older art of painting, the artist took nature for his model, and was able, by the addition of interesting and possible accessories or the omission of unpleasant features, to compose a picture, in some respects, more beautiful as a work of art than could have been achieved by a literal rendering of the various objects which it included; but the peculiar charm of strict truthfulness was neither demanded nor looked for, because it could never be attained, being simply impossible."

Now the first fallacy which strikes me here arises from the confounding of the idea of fact and truth. Mr. Slight seems to think that a thing cannot be true if it is not a fact. But truth in art is like truth in ethics. A thing may be perfectly true to nature, without existing as a fact in nature; whilst, on the other hand, it might have an existence, as a fact, without being true to nature. I will show how. A painter or photographer may produce a landscape with figures, the latter of which may never have been near the scene of the landscape; but they may be so correctly lighted and arranged, and in such admirable keeping and harmony with the scene, that every one at once feels the picture is true to nature, although it may never have had, in its entirety, an existence as a fact. The photographer may, on the other hand, photograph an actual scene in which, by the introduction of incongruous figures—such, for instance, as a man in the robes and chain of a lord mayor carrying buckets of water, or a cat before a plate of cherries—which would be correctly pronounced untrue to nature and art, although the scene had existed as an undoubted fact.

But I think I may easily go further than this, and affirm that, without the perpetration of any wilful incongruity, photography is by no means necessarily nor always true. Not only can it not render the truth of colour, but it frequently fails to translate colour fairly into monochrome, both in portraiture and landscape: witness the rendering of red hair and blue eyes in the one, and deep green and yellow foliage in the other. If a lens of short focus be improperly used, look at the gross errors in perspective produced. If a single lens be used for architecture, upright lines are rendered by curves. If a picture be under-exposed or otherwise mismanaged, a scene in nature suffused by sunlight is rendered in the photograph by a series of harsh black and white patches. By imperfect lighting and injudicious posing, the form of features may be quite altered. By the management of exposure and development, a fine skin may be made to appear rugose, or a coarse skin fine. By the management of accessories, &c., a short person may be made to appear tall, or a tall person short. I should be sorry to be misunderstood in these remarks. I am not decrying photography, of which I am a most enthusiastic votary; but I am simply suggesting that since it can, and often is, made to tell or suggest all kinds of untruths, an argument based upon its "unavoidable power of truthfulness," suggesting a sense of unfitness when it is employed to render something which has not an existence as a fact, must very soon fall to the ground.

Then as to painting. Without going into the arguments of the pre-Raphaelite brotherhood as to the power and duty of rendering the truth as it exists in nature, I think that few persons who have studied the subject will hesitate to admit that painting is capable of more perfectly and comprehensively rendering nature truly than photography can possibly do, both in portraiture and landscape. It is not necessary to enter into an elaborate argument to prove this, nor is it of much importance to recall the traditionary illustrations of the literal truthful power of painting, such as the dish of fruit which was painted with such truth to nature that the birds came to peck at it, or the story of the horse which was so well painted that another horse neighed its recognition, nor the story of the painting of a curtain over a picture executed with so much skill that when the picture was exhibited the painter was requested to lift the veil. These stories may be true or not, but they illustrate that the capacity for rendering literal truth is one of the recognized powers of painting.

I have referred to the possible untruth of photography and the possible truth of painting, not to base any elaborate argument thereon, but to show that Mr. Slight's argument as to fitness, derived from the notion that literal truth is a dominant characteristic of photography, and possible falsehood an equally dominant characteristic of painting, really has very little weight indeed.

I think, however, that the consideration of one or two practical cases is more valuable in a question of this kind than any amount of abstract argument. Let us suppose a case. In my pursuit of the picturesque, I have selected a very charming landscape which I intend to photograph at a given season of the year, when the character of the light, the foliage, &c., are best suited for photographic pictorial effect. An important element in this picture is a noble tree, without which it becomes tame and insignificant. When I come again to the scene, I find my tree cut down, and in its place is a square, ugly little wood-shed, in which the tree is being cut up into faggots. Not very far distant, however, although quite out of my composition, is another similar tree, of which, if I secure a negative, and masking out the wood-shed, print this tree into the place where the other stood, will any one tell me that my picture is not true to nature? Again, if I find that, in taking a landscape with figures, some of my figures move, and I find it desirable to secure them again on a separate negative to be printed in; or if my foreground, containing dark foliage, requires long exposure, and my sky, containing light luminous clouds, requires short exposure, and I take one negative for the sky and another for the landscape, shall I be told in either of these cases that I am violating truth? I think not. If, then, composition- or combination-printing be permissible so long as it be done truthfully, the whole argument is, I think, granted.

And this brings me to the real question at issue—the sphere and scope of photography in art; and I have no hesitation in affirming that whatever photography can render in pictorial art which is in conformity with truth in nature and truth in art, comes within its sphere, and success in such truthful rendering is—as I think the Editor of this Journal has before laid down as an axiom—the touchstone of legitimacy. If the picture produced be in perfect keeping with the truth of nature and the principles of art, it is a legitimate result. Untruth of any kind might be an argument against any individual picture, but not against the principle in discussion. Untruth in painting would be no more justifiable than in photography. When Millais, in his celebrated "Apple Orchard," painted grass about twenty inches high, at the same time when apples were in blossom, and when the grass could not well have grown more than four or five inches high, he perpetrated an anachronism which excited much good-humoured satire. When Landseer painted a child just rescued from the water, with clothes of faultless cleanliness and dryness, Ruskin asked, "Would not its clothes be wet?" These were blunders; and if the photographer were to blunder in an equal degree, he would probably meet with more merciless criticism. But in examining a composition like Mr. Robinson's "Autumn," or "Bringing home the May" (and I would here beg that gentleman's pardon for introducing his name so frequently in this letter: that I can find no other illustrations so suitable must be my excuse), in examining such pictures, I say, we have neither untruth nor incongruity. We have actual English scenery such as is to be found in Warwickshire; we have English rustic figures engaged in common English rural occupation. Every part is true in detail, and the whole is harmonious and true in keeping. There is an absence of anything which suggests patchwork; it looks as if, to use Ruskin's words, "it had been gathered straight from nature." If I may be permitted, I should like to quote a paragraph on the subject, which strikes me as going right to the point; it is from a notice of "Bringing home the May," in the 'Photographic News,' November 1862; and I remember it struck me at the time as covering the whole argument of the legitimacy of "composition-photography." The writer says:—

> "There is that harmony which renders it difficult to remember that this is a 'composition' picture, in the photographers' technical sense of the word. It is difficult to believe in it as the product of several negatives, each part so thoroughly belongs to the whole and so perfectly accords with the whole. Ruskin, speaking of the test of the true artist, says, that his work, or the 'imaginative work,' as he calls it, 'looks always as if it had been gathered straight from nature, whereas the unimaginative shows its joints and knots, and is visibly composition.' The test is an admirable one and admirably put, and may with augmented force be applied to the 'composition,' or rather let us call it, as referring to the mechanism, the 'combined' pictures of the photographer. It is when this test is applied that the picture before us claims its true position as an imaginative work. We do not see the 'knots and joints,' we do not mean the joints in printing, but in working out the conception and composition. Let us add, for the benefit of young photographers who may be tempted to tread in Mr. Robinson's steps, that a work of this kind cannot be produced from a crude conception. Months before this picture was commenced, we received from the artist a well-drawn sketch, in which the design and composition of the intended picture were fully indicated, these being specifically settled before a negative was taken."

The argument with which Mr. Slight attacks the use of "composition," and I think fails to touch it, comes with real force, however, against its abuse or misapplication. When he speaks of a picture which "consists of scraps collected from various quarters of the world," he describes that which would be incongruous and untrue, and not less so in painting than in photography. If, in the first illustration I supposed, of substituting a tree for a wood-shed, instead of printing in a tree belonging to the scene, a huge palm-tree had been introduced, that would have been untrue, incongruous, inharmonious, and unsuccessful. It would not be more true if, by some possibility, a palm-tree had been brought from Kew Gardens and placed in the English landscape for a few minutes, and then portrayed without combination-printing. Without multiplying illustrations, I think it will be readily seen that pictorial truth is one thing, and a literal fact another, and that a picture may be incongruous and untrue in art, whilst it represents a literal fact.

There is one thing in which I express my hearty agreement with Mr. Slight. There are undoubtedly fields of art to which photography is totally inapplicable, whether by combination or single negatives. It is not suited to the rendering of imaginative art. In the ablest attempt of this kind, Mr. Rejlander's "Two Ways of Life," a work in many respects of great ability, photographically and pictorially, there was suggested to most minds a strong sense of unfitness. The allegorical nymphs, with which the picture was crowded, were not abstractions, but literal portrayals of naked women; and the unsuitability of the means to the end impressed every one with an uncomfortable sense of incongruity.

There is another class of pictures produced by "composition" or combination-printing which are still more offensive and incongruous. I refer to the class of thing typified by a picture I have seen exhibited, entitled "The Spirit's Flight." Here photography is employed to portray the disembodied spirit winging its course to regions no mortal eye has seen. Apart from the liberty taken with a sacred subject which will jar on the feelings of many, the utter impossibility of such a thing ever being presented to the camera, the absolute certainty that the figure is that of a young woman in the flesh, travestying the ideal rendering which imaginative painters have given to spiritual beings, at once impresses the beholder with the untruth of the whole thing. It is not only not a fact or possible to be a fact, but it is alike untrue to nature and art, and carries its untruth and incongruity on the surface. All that Mr. Slight says on the question of truth applies forcibly to this class of work, and the application of the art to that of which it is in its own nature incapable simply brings it into ridicule, and cannot be too strongly reprehended.

The abuse of anything is, however, no argument against its use, and I think that it will be admitted by a gentleman so candid and straightforward as Mr. Slight seems to be, that photography may legitimately extend its sphere into the regions of pictorial art, by employing either one or half a dozen negatives, so long as it produces nothing incongruous or unnatural, and so long as its productions are true to nature, whether they represent some actual fact which existed as an entirety or not;

but that photography, whether one negative or twenty are employed, steps out of its sphere in attempting imaginative art, and the embodiment of those creations of the fancy, those airy nothings to which the poet and the painter can alone give a local habitation and a name.

Respice Finem.

All this is admirably stated. We simply add, in conclusion, a brief extract from an editorial article in the 'News' on the same subject:—

"It appears to us that the question really narrows itself within very simple and clearly defined limits. In the first place, it is necessary to decide whether photography can legitimately have a pictorial purpose, or whether it should be confined to the duty of a scientific registrar and witness of facts; and in the next place, if it be decided that photography has any place in art, and may be employed in producing pictures which shall bear the impress of an artist's mind, the question arises as to whether the artist is to be limited strictly to the employment of the common-place appliances of photography, or whether he may supplement these by his own skill, ingenuity, and effort, so as to compass greater results than these appliances will ordinarily achieve. The whole subject at issue seems to be comprehended in these two questions. * * We risk nothing, we think, in taking the answer to the first question for granted. It is in regard to the second question that we ask the attention of those interested in the inquiry to the recognition of a few indisputable facts. It is indisputable that photography is limited in its appliances. Notwithstanding the great progress which has been made of late years in the capacity of lenses, the photographer is still confined in rendering pictorial subjects at one operation to a restricted angle of view. In defining objects in different planes he is bounded by the capacity of his lenses. In the production of large pictures he is circumscribed by the difficulties of process, and the conveniences of baths, plates, and cameras. In the delineation of moving objects, and the catching of expression, &c., rendering necessary in one part of the picture rapidity of exposure, whilst other objects demand protracted exposure, he is circumscribed by similar material or chemical difficulties. These are impediments inherent at present in the facilities presented to his hand, and the question, as we have said, resolves itself into the inquiry whether he is to accept these material limits, or, by the exercise of skill and ingenuity, to overcome them. Our answer is, that the legitimacy of his attempts to overleap these difficulties should be decided solely by the success of his efforts in producing a presentable or satisfactory result, in embodying his pictorial conceptions. * * Without elaborating the argument, we wish to enforce this consideration on the attention of those concerned—That combination-printing is simply a succedaneum for the short-comings of photography and photographic appliances; that untruth in combination-pictures is not on any occasion a legitimate argument against the method, so much as a proof of incapacity in the man applying the method; that so long as there exists a disproportion between the ordinary means of production in any art and the conception of man's mind to produce, higher skill and greater effort will be necessary to supplement the ordinary means. And, in an art like photography, the credit due to the artist, and the appreciation of the admirers of the art, should be in the exact ratio of the greatness of the conception, the inadequacy of the means, and the perfection of the result."

◆

On the Preparation of Dry Plates in Daylight.

By Mr. J. Nicol.

To photographic literature photography is mainly indebted for the wonderful rapidity with which it has advanced to its present high state of being; but at the same time there is one thing in connexion with that literature which must be laid at its door—the neglect of many useful hints and valuable suggestions. Photography, the most popular of all amusements or changes of occupation, includes amongst its admirers large numbers who, from want of previous training, have not acquired the habit of correctly observing and recording, and who, in consequence of the obscurity in which the conditions of success or failure often lie, have frequently attributed effects to wrong causes, and by publishing results which they themselves believed on insufficient grounds to be true, misled and discouraged not a few. The natural result is a little scepticism in matters new and seemingly wonderful, and, in consequence, the overlooking of some very good suggestions. This must be my apology for venturing to direct your attention to the subject of my communication, and concerning which I have absolutely nothing new to say.

In the 'British Journal of Photography' of April 28, Professor Himes, I think, called attention to the fact that a wash with iodide of potassium desensitized an excited collodion plate, or removed any invisible image that might be formed, and that the plate was made sensitive again by simply flowing over it a solution of tannin. The paper was read by many at the time, and I suppose forgotten almost immediately after—at least, I have heard no more of it till now. A week or two since, however, accident brought the curious fact to my recollection; and, having a number of plates prepared in a glass bath in broad daylight for the purpose of watching the formation of some markings that had been troubling me with certain samples of collodion, I washed them well with water containing a chloride, dried, and took them into my dark room and poured a solution of tannin over them. From every plate I got a clean picture, without any tendency to fog or stain.

The negatives now handed round were exposed this forenoon, the time just such as I should have given to an ordinary tannin plate, and they show at least that plates prepared in daylight are as clean and give as good negatives as those prepared in the ordinary way.

I think this important fact should give an impetus to dry-plate work that it has not yet received. Many have been deterred from pursuing it from a disinclination to spending an hour or two in a half dark room after the day's work was over. But it is a very different thing to work in daylight. All that is required is a bath with silver solution, one with distilled water, and one with a two-grain solution of iodide of potassium, bromide of potassium, chloride of sodium, or chloride of ammonia. I used the bromide of potassium, but I think chloride of ammonia would answer better. These may be placed in any out-of-the-way corner, and a plate slipped in at any spare moment. From the silver bath remove into the bath of distilled water, and keep moving about till all greasiness disappears; then into the iodide or chloride for a few seconds or minutes; then wash well with common water, and set up to dry. When dry they may be placed in a plate-box, and they will keep, I should say, any length of time.

To render them sensitive, they should be thoroughly moistened with distilled water, and then immersed in a fifteen-grain solution of tannin, and dried.

Of course, as I have only made a few experiments, you will understand that I do not give this as by any means the best way in which to prepare your plates, but simply as the way in which the negatives now in your hands were done; and I may add the strong recommendation that it is easier, cleaner, pleasanter, and I think more certain, than any method yet practised.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A Council Meeting for the award of Prizes was held, August 12th, at 12 York Place, Portman Square, Sir Thomas Maryon Wilson, Bart., in the Chair. The Minutes of the last Meeting having been read and confirmed, Mr. Glaisher read a very elaborate report on the pictures contributed for the present year, of which the following is an abstract:—

In Class 1 there were 85 pictures contributed, as follows:—J. W. Rimington, Esq., 12; Capt. G. Bankart, 9; Messrs. Lloyd & Howard, 6; H. Cooper, Esq., Jun., 6; C. A. D. Halford, Esq., 6; W. D. Hemphill, Esq., M.D., 5; G. Bevington, Esq., 4; N. K. Cherrill, Esq., 4; T. Brownrigg, Esq., 3; M. Allport, Esq., 3; F. R. Barclay, Esq., 2; J. Clerk, Esq., 2; Col. C. Holder, 2; Sir J. J. Coghill, Bart., 2; F. R. Griffith, Esq., 2; Capt. Mason, 2; Major Gresley, 2; G. Wales, Esq., 2; Rev. F. E. Gutteres, 2; Hon. N. Jocelyn, 1; The Viscountess Jocelyn, 1; St. J. Coventry, Esq., 1; W. Sandy, Esq., 1; A. Suzanne, Esq., 1; W. L. Banks, Esq., 1; G. H. Hodges, Esq., 1; F. Beasley, Esq., 1; F. E. Currey, Esq., 1; J. S. K. Moss, Esq., 1.

In Class 2 there were 106 pictures contributed, as follows:—J. W. Rimington, Esq., 15; C. A. D. Halford, Esq., 12; N. K. Cherrill, Esq., 8; H. Cooper, Esq., 7; W. D. Hemphill, Esq., M.D., 6; Capt. G. Bankart, 5; Messrs. Lloyd & Howard, 5; J. Clerk, Esq., 4; G. Bevington, Esq., 3; T. Brownrigg, Esq., 3; F. Beasley, Esq., 3; Major D. Gresley, 2; Sir J. J. Coghill, Bart., 2; M. Allport, Esq., 2; W. L. Banks, Esq., 2; F. E. Currey, Esq., 2; Capt. Mason, 2; W. Sandy, Esq., 2; W. H. Simpson, Esq., 2; C. Stephen, Esq., 2; W. W. King, Esq., 2; The Hon. N. Jocelyn, 2; J. Wales, Esq., 2; Rev. F. E. Gutteres, 1; J. S. K. Moss, Esq., 1; F. R. Barclay, Esq., 1; Miss A. Crofton, 1; J. A. Silk, Esq., 1; Miss E. Scott, 1; J. Rivington, Esq., 1; J. W. Richardson, Esq., 1; F. R. Griffith, Esq., 1; D. Laurie, Esq., 1; W. R. Penn, Esq., 1.

In Class 3 there were 123 pictures, contributed as follows:—J. Clerk, Esq., 15; J. W. Rimington, Esq., 12; N. K. Cherrill, Esq., 10; F. R. Griffith, Esq., 7; Capt. Bankart, 6; Messrs. Lloyd & Howard, 6; C. A. D. Halford, Esq., 5; G. H. Hodges, Esq., 5; Miss L. Ramsden, 4; Capt. Playfair, 4; W. S. Hobson, Esq., 3; O. J. Jones, Esq., 3; G. Bevington, Esq., 3; W. D. Hemphill, Esq., M.D., 3; J. S. K. Moss, Esq., 2; F. R. Barclay, Esq., 2; R. B. Bowman, Esq., 2; G. D. Atherstone, Esq., 2; T. Brownrigg, Esq., 2; A. Suzanne, Esq., 2; W. W. King, Esq., 2; Hon. N. Jocelyn, 2; A. Booty, Esq., 2; H. Wood, Esq., 2; Major

Gresley, 1; Rev. F. E. Gutteres, 1; W. L. Banks, Esq. 1; The Viscountess Jocelyn, 1; St. John Coventry, Esq., 1; W. Sandy, Esq., 1; Miss E. Scott, 1; W. H. Simpson, Esq., 1; E. L. Williams, Esq., 1; T. Bell, Esq., 1; Col. Dumford, 1; J. Middleton, Esq., 1; Miss C. Powell, 1; W. G. Atherstone, Esq., 1; Hon. Miss A. Crofton, 1; Capt. M. Hutton, 1; W. R. Penn, Esq., 1.

In Class 4 there were 107 pictures contributed, as follows:—N. K. Cherrill, 7; O. J. Jones, Esq., 7; F. Beasley, Esq., 6; Miss C. Powell, 6; A. Gray, Esq., 6; J. Rivington, Esq., 5; Rev. F. E. Gutteres, 4; J. W. Rimington, Esq., 4; F. R. Barclay, Esq., 4; Col. Durnford, 4; Messrs. Lloyd & Howard, 3; W. W. King, Esq., 3; Hon. N. Jocelyn, 3; W. H. Simpson, Esq., 3; G. H. Hodges, Esq., 3; Capt. Playfair, 3; C. A. D. Halford, Esq., 2; J. A. Silk, Esq., 2; Miss E. Scott, 2; J. Richardson, Esq., 2; E. L. Williams, Esq., 2; A. Booty, Esq., 2; W. S. Hobson, Esq., 2; W. D. Price, Esq., 2; R. Milligan, Esq., 2; Capt. M. Layton, 2; Major Gresley, 1; G. Bevington, Esq., 1; W. L. Banks, Esq., 1; W. D. Hemphill, Esq., M.D., 1; J. S. K. Moss, Esq., 1; T. Brownrigg, Esq., 1; T. Bell, Esq., 1; J. Middleton, Esq., 1; J. J. Cotton, Esq., 1; W. G. Hunter, Esq., 1; Dorabgee Pudumgee, Esq., 1; J. Taylor, Esq., 1; H. O. Cholmondley, Esq., 1; R. Murray, Esq., 1; E. H. Clark, Esq., 1; W. R. Penn, Esq., 1.

Class 5 comprises a very large number of pictures, many of which are very good, but which it is impossible to notice in detail.

The following Prizes were awarded:—

To Messrs. F. H. Lloyd and W. D. Howard, a Silver Goblet, value 7 guineas, for a pair of 9 × 7 pictures, "Views in the Tyrol."

To J. W. Rimington, Esq., 3 prizes, viz., a Silver Goblet, value 4 guineas, for a pair of instantaneous sea-pictures, 7 × 5, "Off Cowes."

A Photographic Album, value 1½ guinea, for a 7 × 5 picture, "In the Meadows near Winchelsea."

A Photographic Album, value 1½ guinea, for a 7 × 5 picture, "Study of Foliage."

To H. Cooper, Esq., jun., a Silver Cup, value 5 guineas, for a pair of 7 × 5 pictures, "Charles Surface," and "Charles Surface discovers Lady Teazle."

To Capt. G. Bankart, a Silver Goblet, value 5 guineas, for a pair of 12 × 10 pictures, "Rustic Cottages."

Sir J. J. Coghill, Bart., a Silver Goblet, value 5 guineas, for a pair of 9 × 7 pictures, "Views near Castle Townsend."

W. D. Hemphill, Esq., a Silver Goblet, value 4 guineas, for a 10 × 8 picture, "Kilmanahan Castle."

N. K. Cherrill, Esq., a Silver Goblet, value 4 guineas, for a pair of 7 × 5 portraits of "Horses."

F. R. Barclay, Esq., an elegant Photographic Album, with silver plate, for a pair of 12 × 8 pantascopic pictures, "Views at Bury Hill."

F. E. Currey, Esq., an elegant Photographic Album, with silver plate, for a 9 × 7 picture, "View in Onneshade Glen."

Major D. Gresley, an elegant Photographic Album, with silver plate, for a 12 × 10 picture, "Group of Firs."

F. Beasley, Esq., an elegant Photographic Album, with silver plate, for a 10 × 8 picture, "Hungerford Church."

G. Bevington, Esq., an elegant Photographic Album, with silver plate, for a 7 × 5 picture, "Wreck of the Devereux."

J. Clerk, Esq., an elegant Photographic Album, with silver plate, for a 12 × 10 picture, "View at Penicuik."

The Viscountess Jocelyn, a handsome Photographic Album, for a 9 × 7 picture, "An Interior."

Col. C. Holden, a handsome Photographic Album, for a 10 × 8 picture, "Lake and Pleasure-grounds at Newick Park."

W. Sandy, Esq., a handsome Photographic Album, for a 9 × 7 picture, "View in Salthun Glen."

G. F. Hodges, Esq., a handsome Photographic Album, for a 10 × 8 picture, "View in Grace Dieu Park."

W. L. Banks, Esq., a handsome Photographic Album, for a 10 × 8 picture, "View in Casscoburg Park."

Rev. F. E. Gutteres, a handsome Photographic Album, for a stereoscopic picture, "Cutter Manned and Armed." (Instantaneous.)

T. Brownrigg, Esq., a handsome Photographic Album, for a stereoscopic picture, "Druids' Glen."

Certificates of Honourable Mention were awarded to Major D. Gresley, G. Bevington, Esq., Sir J. J. Coghill, Bart., Rev. F. E. Gutteres, C. A. D. Halford, Esq., W. D. Hemphill, Esq., M.D., F. E. Currey, Esq., J. S. K. Moss, Esq., F. R. Barclay, Esq., J. W. Rimington, Esq., T. Brownrigg, Esq., N. K. Cherrill, Esq., Capt. Mason, The Viscountess Jocelyn, St. J. Coventry, Esq., Messrs. F. H. Lloyd and W. D. Howard, Capt. G. Bankart, F. R. Griffiths, Esq., J. Clerk, Esq., J. A. Silk, Esq., J. Wales, Esq., J. Rivington, Esq., A. Suzanne, Esq., W. W. King, Esq., Hon. N. Jocelyn.

The pictures sent this year were about equal in number to those of last, but were, on the whole, decidedly superior in quality. Indeed the Council cannot expect a much higher average than is presented this year. Although so large an amount has been awarded in prizes, the Council have had more difficulty this time than ever in making a satisfactory award, having been compelled to pass some pictures which well deserved a prize, among which may be mentioned some large Indian pictures, by F. R. Griffith, Esq., several beautiful interiors by C. A. D. Halford, Esq., and some stereos by M. Allport, Esq. Dr. Wilson has sent some excellent microphotographs, and Mrs. C. S. Harris some flower-studies, which, although they can hardly be placed in any particular class, yet must not be passed without notice.

A vote of thanks was then passed, at the motion of Mr. Shadbolt, to Mr. Glaisher for his very able and valuable Report.

The following Members were elected:—Viscount Strathallan, S. W. Williams, Esq., J. W. Jennings, Esq., Elias Howard, Esq.

The proceedings then terminated.

A. J. Melhuish, *Hon. Sec.*

Honours to a Photographer.—The Emperor of the French, with that appreciation of the claims of Art and Science which so distinguishes him from other European rulers, has done honour to photography in the person of Mr. Claudet, on whom he has conferred the Cross of the Legion of Honour.

Royal Cornwall Polytechnic Society.—In the Exhibition held at Falmouth of this important Society, which has just been brought to a close, Photography has occupied a much more prominent place than formerly, probably from the growing conviction in the minds of photographers of the value of the honour which their medals confer. We add a list of the awards.

First Silver Medal.—Mr. James Mudd, for his collection of views in England, Scotland, and Wales.

Silver Medal.—Mr. H. P. Robinson for the best portraits.

Silver Medal.—Mr. W. H. Warner for landscapes from negatives the property of Mr. Grant.

Silver Medal.—The United Association of Photography for specimens of Wöthlytype.

Bronze Medal.—Mr. S. Thompson for specimens of photography designed as book-illustrations.

Bronze Medal.—Mr. J. J. Cole for photographs of rocks and cliff-scenery of Devon and Cornwall, intended to assist geological students.

Bronze Medal.—Mr. J. W. Swan for specimens illustrating his carbon process.

Bronze Medal.—Mr. J. E. Palmer for enlargements on opal glass, paper, and painter's canvas.

Bronze Medal. — Messrs. Stephens and Knecht, of Falmouth, for a collection of beautiful *cartes de visite*

A Money Award of £1.—Mr. Trull, of Falmouth, for a series of photographs.

The portrait of Napoleon the Third, by M. A. Cabanel, which was one of the leading attractions of this year's picture-exhibition in the Palais de l'Industrie, has been photographed by Mr. R. Jefferson Bingham, of Paris. M. Cabanel's fine tones are reproduced in the photograph with a wonderful completeness. This photograph is, in short, as brilliant as the best of Mr. Bingham's reproductions of Decamps.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

North London Medals.—We have received from Messrs. Ottewill and Collis, and from Mr. Hare, certain protests against the decision of the Jurors in the North-Eastern London Exhibition, Photographic Department. We are requested to publish these protests, and we ascertain that, before being sent to us, they had been forwarded to other journals, and published in one. We shall only remark that, as Editor of this Journal, we should have declined, under any circumstances, to print any protest before the Report of the Jurors had been issued; and that a protest conceived in a spirit of such self-laudation, and containing such offensive epithets to gentlemen undertaking a responsible duty, would have been unfit for our columns; but we can further say, as Chairman of the Jury, that there is no foundation whatever either for the protest or the allegations on which they are based. No privilege or favour of any kind was accorded to one exhibitor which was not possessed by all, and the Medals were awarded for distinctly marked superiority on the grounds recorded in the Report, which appears in our present Number. Whenever a competition is instituted, there must be several disappointed competitors. We are glad to find the Medals are so highly appreciated as this angry desire to possess them shows, but should have been better pleased if that appreciation had found less offensive expression.

R. O.—We have seen excellent results of the Simpson-type process by using plain collodion, bought of the Association of Photography at three shillings per pound, made for the Wöthlytype.

Alfred G.—We much prefer hyposulphate of soda to sulphocyanide of ammonia.

J. J.—Stoneware dishes of the size you mention may now be obtained. Formerly nothing larger than those measuring 22×17 were made; but Messrs. Edwards and Sons, of Dale Hall Pottery, Burslem, have succeeded in producing dishes of very perfect make of a larger size. They are necessarily very expensive, as not more than one in ten commenced reach completion, through the various accidents to which they are liable; and in an early part of the process they take about a month to dry before they can be baked.

S. W. J.—The white glass to which you refer has a good effect in frames and cases when new, but after a time efflorescence commences and dims the surface.

No. 162. OCTOBER 16, 1865.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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PHOTOGRAPHIC SOCIETY.

The next Meeting of the Session will take place at King's College, on Tuesday, November 14th, at eight o'clock, when a paper will be read by Mr. J. E. Mayall "On the Construction of a Photographic Glass-house;" and, should time permit, a paper will be read by Mr. Jabez Hughes "On the Preparation of the Iron Developer so as to produce Dense Negatives."

Meetings of the Society, 1865–66.

1865.	Tuesday,	Nov.	14
	„	Dec.	12
1866.	„	Jan.	9
	„	Feb. (*Anniversary*)	13
	„	March	13
	„	April	10
	„	May	8
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On another page we publish the Report of the Jurors, and the awards of honour, made in the Photographic Department of the Dublin International Exhibition. As the Editor of this Journal was appointed on the jury, in conjunction with those gentlemen whose names are appended to the Report, it may be well to explain that, having arranged to be present in Dublin at the time first appointed for the examination of contributions, a postponement of those duties was announced to him, and he was unfortunately unable to attend at the time afterwards fixed. His chief object, however, in referring to this matter here is to give his general approval and confirmation of the terms of the Report, and of the awards made. Thus approving of the Report generally, it may be scarcely important to take exception to any part of it, and to express a qualified assent to the remarks on Mrs. Cameron's pictures. In these photographs, we conceive, Mrs. Cameron does herself and the art she employs alike injustice. Slovenly manipulation may serve to cover want of precision in intention, but such a lack and such a mode of masking it are unworthy of commendation. The awards appear to us to have been distributed with equal discrimination and liberality, and the numbers given and merited a gratifying illustration of the satisfactory exposition of the art furnished at Dublin. We think it worthy of note too, as a contemporary has pointed out, that notwithstanding the unmannerly complaints of foolish persons, and the meddling of mischievous persons in reference to the North London awards, every one of those who received medals at the North London Exhibition who exhibited at Dublin received honours of some kind, either medal or honourable mention, there also—the Firm who with so much confidence awarded themselves a medal at North London receiving at Dublin simply an honourable mention, in company with the manufacturer whose work they declared to be so inferior to their own.

We may take occasion to remark here, that we think it is time that in Photographic Exhibitions a higher standard should be aimed at than has hitherto characterized them. The art is capable of higher effects, and more extended application than it has yet achieved, and we look to future Exhibitions for illustrations of something more than manipular skill or vague expressions of artistic intention. We look for more decided instances of a well-conceived design, thoroughly well worked out, works which shall be beyond dispute, display mental power and design, and prove Photography something more than a mechanical art.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The first Meeting of the present Session was held at Myddelton Hall, Islington, on Wednesday, October 4. Mr. G. Wharton Simpson in the Chair.

The Hon. Sec. (Mr. Barnett) read the Minutes of the closing Meeting of the last Session, which were approved.

The following Gentlemen were elected by ballot Members of the Association:—

Mr. W. G. Parker, 97 Guildford Street, Russell Square; Mr. A. East, Hertford.

Mr. Cooper laid upon the table some beautiful pictures developed by his new organico-iron developer, which were very carefully examined, and appeared to be much admired. He also made a statement of the mode of preparation adopted by him, which statement he has since reduced to writing, as follows:—

A Modification of the New Organico-Iron Developer. By H. Cooper, Jun.

At the Meeting of the North London Photographic Society, held on the 4th inst., I had the pleasure of bringing before the Members some specimens produced by a modification of the organico-iron developer, which has given the most perfect results. It has since been proposed to me that it would be advisable to write the formula myself, in a concise manner, for convenience in reference, for those who may be desirous of giving it a trial. As I consider this developer to be one of the most useful and important practical discoveries of late, I shall now proceed to do so, referring readers to the Report of the Meeting for some cursory remarks on its good qualities and advantages.

You must first procure some good gelatine—the ordinary French sheet answers well—and place two drachms of it in a common jam-pot or other convenient *earthenware* vessel, with four drachms of water. Then add one ounce of common strong sulphuric acid. Upon mixing well together with a glass rod, the temperature will rise considerably, and the gelatine will begin to be decomposed. If the mixture be stirred occasionally, the action will be complete in about twelve hours, sometimes in a much shorter time. The gelatine will have entirely dissolved, and the solution will not be more viscid than dilute sulphuric acid.

One thing that I forgot to mention at the Meeting is the necessity of adding about four ounces of water to the sulphuric acid and altered gelatine at this stage of the operation. This is absolutely necessary, and must on no account be omitted. Now add sufficient aqua ammonia to neutralize the free sulphuric acid. It is as well to make the solution slightly alkaline, as any trace of sulphuric acid must not remain. The effect of omitting to add the four ounces of water before neutralizing will be that when the ammonia is added, a violent action will ensue, and the liquid will be spirted about in all directions; and I can assure you that strong sulphuric acid is not an agreeable thing to get upon the hands, face, or clothes; but if you proceed in the way described above, there is not the slightest danger. The next thing is to raise the solution to the boiling-point. This may easily be effected by standing the vessel containing it on the hob, or in an oven. After it has cooled, add sufficient water to make the total quantity eight ounces, and then filter. This we will call solution No. 1.

Now, to make solution No. 2, soak one drachm of gelatine in six ounces of water for a couple of hours, then add two ounces of glacial acetic acid. By shaking or stirring a few times, the gelatine will be soon dissolved. If not quite clear, it must be allowed to settle until it is so. Then add it to solution No. 1.

You will now have a stock solution of 16 ozs., which is to be used in making the developer instead of plain acetic acid. A very useful formula is the following:—

Protosulphate of iron	25 grs.
Mixed solution, prepared as described	2 drms.
Water	1 oz.

This, you see, gives a developer of the strength of 20 grs. to the oz. A stronger or weaker one may be used at discretion, by altering the proportions of the above formula. As I hope to bring the subject before you shortly in a better form, it will be sufficient for the present to add that in my hands this developer has given the most complete satisfaction—so much so, that since I first tried it I have used no other, except for experiment. Some of its peculiarities, mechanical as well as chemical, were stated at the North London Meeting; so I need not recapitulate them here. I shall be happy to answer any inquiries through the medium of the Photographic Journals.

In mixing the two solutions a few precautions are necessary. The best way to proceed is the following:—We will suppose that you have made eight ounces of each solution, as has been already directed, the same method of treatment being adopted if the quantity be larger or smaller: take seven ounces of No. 2, and gradually add some of solution No. 1, stirring or shaking meanwhile, until a permanent milkiness is apparent; then add sufficient of the reserve ounce of No. 2 to render the solution bright and clear. I have not yet made many experiments to ascertain the cause of this milkiness; all I can do at present is to state the bare fact that if some of No. 2 be poured into No. 1 a ropy precipitate is formed, which is redissolved in an excess of No. 2. If it be preferred, and I think it is better, the two solutions may be kept separate, and one drachm of each added to the ounce of developer.

The only difficulty in the preparation of this developer is in solution No. 1; but I think that very soon it may be purchased of some chemists ready prepared.

The CHAIRMAN said he was sure that every one present would join with him in the expression of thanks to Mr. Cooper for the interesting and valuable communication he had just made to the Association. The subject was a novel one for discussion. There had been various communications in the Journals respecting it; but, as yet, it had not been discussed in the Societies. In his estimation, it was one of the most important and useful subjects which could come before photographers. In his own experiments, and in the experiments of others which had come under his observation, this developer possessed advantages which must strongly recommend it to photographers. It had two extremely good qualities—one mechanical, the other chemical. Its mechanical superiority was that it flowed perfectly over the plate, almost like oil, showing no tendency whatever to stains. It was also very slow in its action, which fact, in addition to its even flow, was a great advantage in the prevention of stains. Every one present was aware that in the use of the ordinary iron developer, if there were the slightest arresting of the flow of the fluid, a mark on the plate was sure to follow; but with this developer the commencement of the action was so slow that even if by accident there was a slight wave, a little hesitation in the flow, the matter could be rectified and no noticeable stain produced. Then, chemically, from its organic character, it enabled them to get a greater degree of density, a greater degree of non-actinic quality. The negative was browner, and less permeable to light than when the ordinary iron developer was used. In many instances he had seen perfect printing-density with one application of this developer, without the use of any free silver or any further intensifying. It appeared to him, therefore, that with such a developer they had a subject for very interesting experiments; and probably, as there had been a little difficulty in its preparation, some of the Members would be able to suggest considerations in reference to it which would be useful to all.

Mr. BOCKETT inquired whether, from experience, Mr. Cooper could prepare the solution so as always to give the same results.

Mr. COOPER said he could. In making a developer in the way mentioned by Mr. Carey Lea, the same tiresome performance had to be gone through each time, and always with the chance of failure; but with this solution, he thought the probability of failure was very small indeed. All that had to be done was to dissolve the sulphate of iron in water, and then use a portion of the mixed solution instead of ordinary acetic acid.

Mr. BOCKETT remarked that, it seemed to him, in all cases where sulphate of iron was used with water, after a while the solution would begin to decompose.

Mr. COOPER said he now understood Mr. Bockett's question to be—would the solution which he prepared keep? In reply he would say that he had used a portion of solution immediately after it was made, and another portion of the same solution a fortnight afterwards, and had found no difference in the results. In some of his experiments, when he simply used gelatine dissolved in acetic acid, if he placed more in solution than he actually wanted, a deposit was formed when it had stood for a day. Another difficulty which he also found was, that it was almost impossible to filter the developer; but with the preparation he had mentioned the solution was easily filtered, and so far retained its properties that some which he had had for five weeks gave no different result than that the picture was slightly more yellow in colour. In answer to further inquiries, he observed that he had not found it stringy at all; the solution was almost as limpid as pure water.

Mr. BOCKETT asked how it would bear the addition of silver for intensification.

Mr. COOPER said he had forgotten to mention that if a small proportion of silver only were added, the development might be continued without any more restraining acid. For ordinary intensification he used some of the same developer.

Mr. BOCKETT could not see what was gained by the use of citric acid, seeing that Mr. Cooper had such a restrainer as sulphuric acid.

Mr. COOPER replied that the sulphuric acid was neutralized by forming sulphate of ammonia. The only restraining action he had was from the gelatine, and what he supposed might be called glacial acetic acid.

Mr. FOWLER asked whether there was any tendency to fog with a very old bath.

Mr. COOPER said there was not. With some of the pictures exhibited he had employed a bath which had been in use since September. In fact fogginess was almost entirely obviated. He might also mention that the negatives become more intense on drying than ordinary negatives with which protosulphate of iron had been used. The Chairman had called attention to a slight difference in colour which he had observed. He (Mr. Cooper) had not found such to be the case in his experience; indeed he could get a brilliant print from an apparently thinner negative. On one of the pictures exhibited there was hardly any deposit, even on the highest lights; and using a negative of that character, of course the printing proceeded very rapidly. In reply to other Members, Mr. Cooper stated that he used ordinary sulphate of iron; he had tried double, and also a kind of triple salt, but did not find any advantage. The actual development in all cases was longer, and that was one of the great advantages of employing his solution, as it enabled the operator to have the most perfect control over the process. It was also very convenient in a mechanical way. Very often while developing it became necessary to examine the negative, in order to see the progress of the operation; but in ordinary cases to hold it up to the light would result in a mass of streaks. With this developer there was no tendency of that kind.

The Chairman said, a few days previously he was in the studio of Mr. Jabez Hughes at Ryde. He found that that gentleman was using a modification of this developer, in which the gelatine had been first dissolved in acetic acid, and then the ordinary solution of sulphate of iron added in place of the restraining acid usually adopted. Mr. Hughes had been employing this developer for the last two months, and he spoke of it as the best he had ever known for facility in operation and excellence of results. He (the Chairman) saw a large number of portrait and landscape negatives that Mr. Hughes had produced, which all possessed those excellent qualities Mr. Cooper had spoken of. In landscape work the fullest possible amount of intensity was obtained at once in almost every case.

Mr. Cooper said, another and very great advantage was that the negative did not lose intensity upon being varnished. He had not met with a single instance in which the film had split upon drying; on the contrary, it appeared more firmly attached to the glass than when the ordinary solution of iron was used.

Mr. Bockett remarked that the splitting of the film generally took place from over intensification, and also from the collodion being somewhat old. By the use of this developer, as he understood, no after intensification was necessary.

Mr. Cooper said that was so; still the development occupied longer than it would to develope and intensify the picture by the ordinary mode.

Mr. Bockett said he always fancied that the nitric acid in the nitrate of silver itself had a great deal to do with the breaking up of the film. In proportion to the greater quantity of nitrate of silver put in to bring up the negative was the danger of losing the film.

Mr. Cooper said, no doubt in that case a very coarse and loose deposit was obtained, which tended to split the film.

The Chairman said, this was a subject which it would be well to bring before the Association again for consideration. Many of the Members would probably try the developer, which was simply made, and evidently possessed many advantages. There could be no question that, with experience, some very interesting results would be obtained.

Mr. Bockett suggested that the subject should be resumed at the December Meeting, promising in the mean time to make some experiments. He said he knew that some persons had been withheld from employing the developer, having heard that such different results were obtained.

The Chairman said he had a strong opinion that much of the want of success had arisen from photographers' adopting Mr. Carey Lea's formula up to a certain point only, and not being careful to neutralize the sulphuric acid with acetate of soda as he recommended.

Mr. Barnett asked whether, in fixing, Mr. Cooper used hyposulphite or cyanide.

Mr. Cooper said he always used hyposulphite of soda.

The Chairman said Mr. Hughes invariably used hyposulphite and not cyanide. He wished every photographer would do the same.

Mr. Cooper said, if any of the Members did not like the trouble of preparing the gelatine solution, but desired to make an experiment with this developer, he should be very happy to make them a present of a little.

The vote of thanks to Mr. Cooper was very cordially adopted, and the suggestion of Mr. Bockett to resume the subject at the December Meeting was put and agreed to.

DUBLIN EXHIBITION.

The Report of the Jury, and the List of Awards.

Report.

The department of Photography at the International Exhibition of Dublin, as might be expected from the geographical position of that city, does not exhibit so complete a representation of the art as could be wished. Many photographers of reputation in England, France, Germany, America, and other countries, are wanting; and this deficiency is the more observed when we recollect the great display of photography at the International Exhibition of 1862, and the splendid specimens there collected from all parts of the world. We must, however, bear in mind that photography had then attained a very high state of perfection, and that it was not to be expected it could, in so short a period as three years, show any very great advance. Nevertheless, under all disadvantages, it must be admitted that the display is successful.

The Photographic department has been well organized; spacious rooms of an easy access have been devoted to the display of the specimens. The only thing to be regretted is the want of top light, without which no picture can be shown to advantage, and especially photographs, which are generally taken either in open air or under skylights, with light from above. As a rule, pictures should be viewed with the light in the same direction as that in which they are produced or painted; otherwise there is something false and unnatural in the effect. For this reason photographs, being nearly always taken with the light more above than under an angle of 45°, should be exhibited under top lights.

Notwithstanding these somewhat hypercritical remarks, made for the sake of a better arrangement in future exhibitions, the public has had a very good opportunity of examining and comparing the merits of all the various specimens exhibited, including some interesting new processes introduced in the art since the Exhibition of 1862.

These new processes are—the Wöthlytype, the developing by formic acid, the Simpsontype, the casket portraits, photosculpture, and carbon processes. These new discoveries have given to the Dublin Exhibition a character of great interest, and go far to compensate for many of its unavoidable deficiencies. The absence of many English and foreign photographers of reputation is apparent from the deficiency of artistic character, particularly in portraiture, though, of course, there are brilliant exceptions; and we call attention to this with the desire of pointing out to photographers how essential is this quality, and that without it photographic portraiture cannot obtain the support of the well-educated part of the community, and deserve the encouragement of those who, by their studies and artistic instruction, generally lead the taste of the public. In portraiture the aim should be not only to produce well-defined, clear, and good photographs, but to give to the sitter a natural *pose*, without vulgarity; to arrange the draperies with taste; to avoid unnecessary and incongruous accessories, and so to light the subject that the features and countenance will be brought out in the most favourable way. We are especially led to these remarks by the examination of a number of portraits and groups exhibited by Mrs. Cameron, which, although as photographs very indifferent (arising, possibly, from the want of first-rate apparatus, a sufficient experience in manipulation, or from other causes), are the works of a true artist. There is no experienced judge who would not prefer these productions, with their manifest imperfections, to many of the best-manipulated photographic portraits which are to be seen in the Exhibition.

The more Mrs. Cameron's productions are examined, the more they are appreciated. At first sight they may be neglected and misunderstood, but at a second and third visit her frames are those which at once attract attention.

That composition is the main quality in photographic portraiture, and that mechanical skill and artistic taste may be united with it, is well exemplified in the portraits and groups exhibited to which medals are awarded. In addition to those selected for award of medals, the studies by the late Viscountess Hawarden are worthy of the highest commendation. The Jury feel sensibly the loss which the photographic art has sustained in the death of so accomplished an artist, and regret that they are thus prevented from marking their sense of the merit of Lady Hawarden's pictures by the award of a medal.

A cursory inspection of a number of photographic portraits will generally enable a correct judgment to be formed how far the operator is a person of taste and refinement, and has had artistic training. Such men never exhibit what is deficient in effect and composition; as they cannot always be successful, they have the good sense to know their failures, and they reject or destroy every negative, however perfect it may be as a photograph, if the artistic effect and composition are not completely satisfactory.

There is another point which, though not strictly connected with photography, calls for observation. We allude to the mounting and frames in which photographs are frequently exhibited. Here again the true artist may be detected by his choice in this direction. When photographs are surrounded by gaudy borders, strange devices, inartistic ornaments, and discordant colours, it can scarcely be expected that they have been produced by operators of sound taste; and when examined it will assuredly turn out that they exhibit more or less incongruity or irregularity in the *pose* and composition. Those remarks have been called forth by the display of too many of this class of mounting and frames in the present Exhibition.

The choice of the subjects for exhibition is another test of the artistic training and natural disposition of the operator. The portraits exhibited should be of eminent persons, in whom the public take an interest, the principal merit in such an exhibition being its historical and instructive character, or they should be selected as illustrations of beauty of features and excellence of form. A photographer who exhibits productions without reference to these conditions, however perfect they may be as the result of manipulation, lowers the art he is practising, and shows that he is not an artist.

In many cases frames are exhibited containing one or two dozen of portraits, without any care or reason for their selection, and the exhibitor would have better served his interest and his reputation had he chosen out of that number two or three specimens and rejected all the others.

The same remark may be made respecting the reproductions of landscapes, buildings, and views of ancient and modern architecture. None should be exhibited if the subject has nothing to make it interesting. The subject chosen by the photographer is the surest criterion of his feeling and taste, and, in exhibiting pictures which please the eye and elevate the mind, he ennobles the art he is practising. The *desideratum* for a photographer is to know when he has succeeded in producing a satisfactory result—and this, it appears, is not so easy a matter.

It is not to be supposed that such men as Bedford, Maxwell Lyte, Mudd, England, Heath, and others, have never failed in their attempts. But they have had the judgment and good taste never to exhibit a picture which is not remarkable in some of the qualities which distinguish the true works of art. When we examine the specimens exhibited by such artists we cannot but acknowledge their excellence, that they do the greatest honour to photography, and are capable of elevating it to the rank of fine art. Vulgarity and absence of taste have been the greatest enemies of photography, and, if not checked in time, will degrade the art and cause the decadence of that marvellous discovery of which there appear already too many signs.

Landscapes, mountain and sea views, architectural subjects, ancient and modern, all these are a field which cannot be worked out except by those who understand the Beautiful. The mere choice of the subject, the moment at which it is to be represented, when the effects of light are the most favourable, require the eyes and feeling of artists. In their hands photography is only the means of catching the picture they have selected, to represent nature in some point of beauty. For this, they must, of course, make use of perfect instruments, and manipulate well; but the principal merit of their works is due to the selection of the subject, and to the treatment of its reproduction.

The enlargement of photographs has been illustrated by some good specimens; but they are generally deficient in the choice of models. It is especially important in this class of works, that the operator should choose pleasing subjects which might induce the public to encourage this branch of the art, and serve as studies to the painters. There are features which ought never to be enlarged to the size of nature by the process of photography. Enlargements may be usefully employed by clever painters, who, in preserving the likeness and the true proportions of the features which they have for their guide, are capable of imparting to the picture the refinements of art, and thus produce a pleasing likeness from an unpleasing photograph. As mere photographs, enlargements of portraits will rarely be pleasing, and are not suitable for exhibition to the uninitiated public.

Among the examples of enlargements there are two series of this kind of production from the same negative, enlarged from its small size, in various proportions gradually increased. They are all beautifully defined, and well executed, showing great skill in the photographic manipulation. These enlargements performed by the solar camera of Dr. Von Monkhoven, have been produced and exhibited by Mr. Mayall. They show the great perfection of this improved apparatus.

The specimens of rapidly taken portraits of children, produced by the means of *formic acid* developer, are bright and clear, and prove that the negatives made by this new developer have all the qualities of the best ordinary modes of development. This is exemplified by a number of instantaneous portraits of babies and groups of children, exhibited among the contributions of Mr. Claudet. His son, Mr. Henry Claudet, by a proper combination of other substances with formic acid, has brought out in all its force the developing power of this acid, the employment of which as a photographic agent had originally been suggested by Mr. Maxwell Lyte, and he has liberally published his formula in the 'Journal of the Photographic Society,' so that every photographer can avail himself of its advantages.

Mr. Wharton Simpson, well known for his scientific researches in photography, and his unflinching devotion to the art, actuated by the same honourable feeling, has also published, through the Photographic Society, his very interesting discovery of a process called *Simpsontype*, which has introduced great simplicity in the manipulation, and which, for this reason, will be very useful to the amateur as well as professional photographer. The specimens shown are very effective and perfect, and a medal has been awarded to him.

Swan's carbon process is deserving of high commendation, and is a step in the right direction; and the Jury desire to mark their sense of its importance by the award of a medal.

The *Wöthlytype*, invested by Mr. Wöthly, a German photographer, is another recent process which would be a great acquisition to the art of photography, if it should turn out, as announced, that the substances employed in its manipulation are less expensive, the manipulation more simple, and that the pictures printed by this means are less liable to fade than when produced by the usual process. However, on this last merit time alone can decide. A number of specimens, produced by the Wöthlytype, have been exhibited, produced by the United Association of Photography. Their effect is generally good, but, as much as can be judged from their appearance, they are far from presenting any sign of stability, or any quality of superiority over the old process. Nevertheless, the discovery made by Mr. Wöthly is an important step in the road of progress, and, with the improvements which experience only can suggest, it may become very useful.

Photographic portraits and views of caves and caverns, obtained by means of the magnesium light, have been produced and contributed by Messrs. Brothers, of Manchester.

Although, except in the polar regions, where the sun is invisible during a great part of the year, there seems to be no advantage in taking portraits by artificial light, but, on the contrary, expense, difficulty, and absence of all artistic effect, still it is highly interesting that we should be able to obtain by these means views of places where the light of the day can never penetrate; and on this account photographers who endeavour to master the process of magnesium light, and to improve the instruments employed, deserve to be encouraged for their exertions and ingenuity. The portraits taken by the magnesium light by Messrs. Brothers are very good, considering all the difficulties they have had to overcome. They may, at all events, show the great power of that light, and for this reason they illustrate a very interesting scientific experiment.

One of the most curious novelties in the photographic exhibition is the production of what are called *casket portraits*, specimens of which are contributed by Mr. Swan, the inventor. For such a really ingenious, original, and scientific contrivance it seems that the author might have found a more appropriate name, designating more properly the principles upon which it is based, and the manner of its construction. It is, in fact, neither more nor less than a real stereoscope, in a different form from that well-known instrument.

Without being conscious of it, the observer has before his eyes, as in the ordinary stereoscope, a picture composed of two different photographs superposed, each one separately visible to one eye and invisible to the other. These two pictures, placed at right angles on the two sides of two rectangular prisms, with their hypothenuse in contact forming a quadrangular block of glass, are covered to the eye, one from the back surface by refraction, and the other from its hypothenuses by reflexion, after having been refracted upon it by the other prism. By the optical law of the angle of incidence and reflection the reflected image is seen only by one eye, the axis of which coincides with the refracted ray, and is invisible to the other eye; and by the law of refraction the other image is seen only by the eye, the axis of which coincides with the refracted ray, and is invisible to the other. So that when the observer is placed exactly in the position from which each eye has the exclusive perception of the image, whose perspective belongs thereto, the two images coalesce on the two retinæ, and the sterescopic perception is brought out in all its beauty and force. The only defect of the apparatus is, that the observer is obliged to find the exact position from which the phenomenon takes place exclusively, and if he lose that position, by the slightest movement of the head, he sees only one or the other image, and there is no illusion of relief, the picture having the flatness of the single photograph which represents it. Notwithstanding that imperfection, Mr. Swan has succeeded in contriving a most ingenious instrument, which elegantly illustrates a very extraordinary phenomenon of optics.

In coloured photographs Messrs. Lock and Whitfield stand deservedly at the head of this branch of the art; the portraits exhibited by these gentlemen display a high degree of artistic execution and skill in selection of *pose* and treatment.

Among the interesting objects for the delineation of which photography has been applied, the Jury desire to notice the views, taken by the Countess of Rosse, of Lord Rosse's great telescope and its arrangements.

The Photographic Exhibition of Dublin has had the advantage of bringing before the public a new application of photography, consisting in the process known as *Photosculpture.* A number of busts and statuettes, illustrating the process, have been exhibited by the International Photosculpture Company. The inventor, M. Willeme, an eminent French sculptor, having first tried to avail himself of such photographs as he could procure as a guide when modelling, was struck with the idea that if instead of only one portrait he had a great number of photographs, representing the person all round from every point of view, he might use them each in turn to shape his model by means of a pantograph, one point of which could follow consecutively the outlines of each photograph sufficiently enlarged, while the other point of the pantograph would transfer, in any reduced scale desired, the same outlines on the block of clay.

The sitter being placed in the middle of a glass room, surrounded by twenty-four cameras, all operating at once, as many photographs can be taken at once in a few seconds. M. Willeme considered that thus he had all that he wanted to transform his block of clay into a perfect plastic representation of the features, forms, and character of the person, and, this work being done, he had only to smooth down the roughness of the various cuttings, and to communicate to the model all the refinement which his skill as a sculptor could suggest. The result, as is shown by the specimens exhibited, has proved the merit and the power of the invention. Photosculpture must be hailed as one of the most useful and noblest applications of photography; and it is destined to spread the taste for sculpture, which is now confined to a very limited number of highly educated minds in the higher classes of society. Photography has received another beautiful and useful application by the process invented and practised by M. Lafon de Camarsac. Some specimens are exhibited by M. Silvy, a photographer distinguished by his artistic taste. One of them is from a photographic negative taken by M. Silvy, representing a group of a great number of distinguished persons, including some members of the royal family of England, and the ex-royal family of France at the fête champêtre given last year at Orleans' House, in aid of the fund of the "Société française de Bienfaisance."

Photography on enamel presents many advantages, the pictures being burnt in or fixed by the action of fire, like metallic colours on porcelain or glass, are not liable to fading like photographs on paper, and they may form ornaments to be worn by ladies, or placed in cabinets or on tables in the drawing-room, as they are indestructible except by breaking. As enamels they may be painted in colours, also burnt in, and unalterable, and resemble the finest miniature on ivory. Those who have had the opportunity of admiring at the Kensington Exhibition the beautiful collection of enamels painted by old and modern artists will be glad to know that photographic portraits may be transformed into similar indestructible and splendid miniatures by living painters, who having only to impart to the photograph the natural colours, with all the refinement which their skill may suggest, will produce the most valuable and perfect works of art.

There has been at the Dublin Exhibition a deficiency of instantaneous stereoscopic productions, such as those which were exhibited at the International Exhibition of 1862, by Messrs. Ferrier and Soulier, by Mr. Wilson and others, the effect of which was so beautiful and extraordinary. It is to be regretted that this class of photographs has not been largely represented; however, there has been enough shown to illustrate the capabilities of instantaneous photography; Mr. Breese has exhibited his marvellous effects of moonlight, sea, and clouds scenery. Nothing can more fully express the instantaneity of Mr. Breese's process than his having been able to represent the waves of the sea during their rapid rolling motion in curling form with spray, suspended in the air, and falling in vapour, while sea-gulls are seen flying about watching for their prey. In looking at such marvellous pictures we feel transported, as if by magic, before the actual scenes, and the illusion of reality is irresistibly impressed on the mind. The means employed by Mr. Breese to produce these combined effects show great ingenuity, patience, and a considerable amount of artistic taste, for no one with a knowledge of photography can for a moment imagine that the sea or landscape have been taken simultaneously when only lighted by the moon, which is represented above. To produce such effects with the light of the moon would require a photographic preparation two or three hundred thousand times more sensitive than any process known. The moon itself can produce its own image, because, lighted in the same degree by the sun, it reflects a light as intense as ordinary clouds in the daytime, which clouds operate instantaneously.

Microphotography has also been represented by the frames exhibited in the English department by Dr. Maddox (92), showing some very well-defined tests considerably magnified. M.

Duvette (122), in the French department, shows some very good specimens; and particularly a remarkable one of a flea enlarged, piecemeal, many thousand times.

Mr. Dagron also has exhibited some beautiful specimens of microphotography; they are mounted at one end of a small cylinder of glass, the other end of which is ground like a microscopic lens, generally called the Stanhope lens, but of which Sir David Brewster claims the invention. The tube is about one-quarter of an inch long, its diameter one-sixteenth of an inch. It is wonderful to think that this constitutes a microscope, with its lens at one end and the photograph at the other. Although this photograph is imperceptible to the naked eye, still, by looking at it through the minute microscope, we see the portrait of a person as large as nature; a page of the Bible we can read as easily as in the book. This minute optical instrument, with its imperceptible photograph, can be mounted in rings, watch-keys, pin, or any other small ornaments. The productions of M. Dagron are a very charming and wonderful combination of photography and microscopy, in which he has seen his way to a considerble branch of manufacture; and for this object he has formed a large establishment in which, by a well-organized division of labour, by well-combined machinery, everything is done on the spot—taking the large photograph, reducing to the microscopic size, manufacturing the small microscope, mounting the picture, making the articles of jewellery themselves. M. Dagron has exhibited the instrument by which he can reduce any photograph to the microscopic size, and by which he can produce at once, upon a collodion plate of about three inches by three inches, twenty-five or thirty microscopic pictures. The pictures are afterwards divided by a cutting diamond, ground in disks, and fixed at the end of the small microscope. The whole process is very rapid, simple, and ingenious, and so well constructed, that the microscope, with its photograph, can be sold as low as twelve shillings per dozen, ready to be mounted by the jeweller in any kind of trinket or ornament.

At the suggestion of Sir David Brewster, M. Dagon has produced sterescopic pictures, and mounted them at the two ends of the gold bar by which a chain is held in the button-hole of the waistcoat. The gold bar is no longer than two inches, and it may be extended by a sliding tube to two and a half, to suit any separation of the eyes. The idea of a microscopic stereoscope is very curious.

It is satisfactory to see that photography is extending its ramifications to the remotest parts of the world, and that the English colonies have furnished some very good contributions to the Dublin Exhibition. Such productions have a double interest; they show that photography is appreciated and encouraged in these far regions, and that this offspring of science is following civilization everywhere; besides, it brings to us faithful representations of countries which only few have had, and will ever have, the opportunity of visiting. Photography alone can illustrate with truth the descriptive records of travellers, giving to us the history of the progress of the colonies which the Old World is establishing in every part of our globe for the improvement, enterprize, and development of the human race.

The Dublin Exhibition affords a very interesting and manifest proof of all the advantages and merits of photography, and shows that the new art has become the indispensable auxiliary of both art and manufactures in furnishing the illustrations of all their productions. There is hardly a department of the Exhibition in which the exhibitors have not availed themselves of photography to represent the articles they exhibit or the instruments by which they are made. But it is particularly in the Department of Machinery that photography has rendered eminent services in showing the mode of their production and their various applications. A remarkable example of such illustrations is seen in the Prussian Department, showing the machines under their various aspects, and the extensive works in which they have been manufactured, with the appliances which have been used in their construction.

Thus the exhibition of photography has not been confined to the particular department which has been devoted to it; it has indeed invaded the whole of the elegant Palace, being in fact the indispensable adjunct of every specimen of art and manufactures from all parts of the world.

Not only the contents of the Exhibition have been reproduced by photography, but the Palace itself, in all its most elegant and picturesque aspects, has been represented in photographs executed by the Stereoscopic Company. The beautiful stereoscopic views taken by that spirited association will remain for a long time interesting subjects of observation, and afford a pleasing recollection of the International Exhibition of Dublin in 1865. It will enable those who have been deprived of visiting it personally to see it in all its actual reality.

In conclusion, it is a great satisfaction to state that photography, on the whole, has been well represented at the Dublin Exhibition, forming one of its most conspicuous and interesting features; this will be a source of congratulation to the photographic exhibitors in general, a cause of encouragement to its devotees, and a helpful impulse in the right direction, giving the hopes of still more glorious successes in future Exhibitions.

A. Claudet.
P. Le Neve Foster.

List of Awards.

MEDALS.

United Kingdom.

The London Stereoscopic Co., 53 *Cheapside, London.*—For good manipulation, and great variety in their productions.

Ross, J. E., 90 *Prince's-street, Edinburgh.*—For artistic feeling in the *pose*, particularly of children.

Rejlander, O. G., 129 *Maldon-road, London.*—For excellence of artistic composition.

Mawson & Swan, 9 *Mosley-street, Newcastle-on-Tyne.*—For Swan's carbon-printing process.

Lock & Whitfield, 178 *Regent-street, London.*—For great artistic merit in their painted photographs.

Robinson, H. P., 68 *Canonbury-park South, London*, N.—For excellence in his manipulation, and artistic effects.

International Photosculpture Co., *Old Broad-street, London*.—For the excellence of their productions, obtained by means of Willeme's process of photosculpture.

Casket-Portrait Co., 40 *Charing Cross, London*.—For the ingenious optical arrangement for producing stereoscopic effect.

Jocelyn, Viscountess.—Excellence in manipulation and selection of artistic subjects.

Amateur Photographic Association, 12 *York-place, London*, W.—For the pictures by Major Gresley, Earl of Caithness, Dr. Hemphill, Mr. Chidson, and for "Caryatides."

Caithness, Earl of, 17 *Hill-street, London*, W.—For his good manipulation and artistic choice of subjects.

Heath, Vernon, 43 *Piccadilly, London*.—For excellence in manipulation, and artistic choice of subjects.

Hemphill, W. D., M.D., *Clonmel*.—For excellence in manipulation, and artistic choice of subjects.

Maddox, Dr., 2 *Foster-lane, London*, E.C.—For excellence in his microscopic reproductions.

Bedford, F., 326 *Camden-road, London*.—For excellence in his manipulation, and artistic effect.

England, W., 7 *St. James's-square, Notting-hill, London*, W.—For excellence in his manipulation, and artistic effect.

Mudd, J., 10 *St. Ann's-square, Manchester*.—For excellence of manipulation, and artistic selection of subjects taken by the collodio-albumen process.

Thompson, Thurston, *Campden-hill, London*, W.—For excellence in his reproductions of Turner's pictures.

Breese, C. S., *Acock's-green, Birmingham*.—For excellence of manipulation and artistic effects in transparent photographs, and for his very ingenious combination printing.

Joubert, F., *Porchester-terrace, London*, W.—For excellence in his reproductions of paintings.

Russell, Major.—For pictures illustrative of experiments in reference to the use of bromides in the dry process.

Bourne.—For excellence of manipulation, and choice of Indian subjects.

Simpson, G. Wharton, 36 *Canonbury-park South, London*, N.—For his collodio-chloride printing process.

Blanchard, V., *Camden-cottages, London*, N.W.—For good manipulation and artistic excellence.

Mayall, J. E., 224 *Regent-street, London*, W.—For a series of pictures illustrating various degrees of enlargements, and for his skilful manipulation.

Rouch, W. W., 180 *Strand, London*, W.C.—For artistic excellence and good manipulation.

Victoria.

Osborne, W.—For his photo-lithographic process, shown under the names of Korn & Co., *Berlin*, and C. W. Liger, *Victoria*.

Bavaria.

Adams, B., *Munich*.—For excellence in his reproductions of paintings.

France.

Panhard, Bros., *Paris*.—For excellence of manipulation, and artistic skill.

Duvette, A., *Paris*.—For his mode of enlargement to an extraordinary size of microscopic objects.

Lyte, F. M., *Bagnères de Bigorre*.—For excellence of manipulation and artistic choice of subjects.

Dagron, *Paris*.—For his micro-photographs, and ingenious arrangements for taking and showing them, &c.

Saxony.

Hanfstaengl, H., *Dresden*.—For excellence in his reproductions of paintings.

HONOURABLE MENTION.

United Kingdom.

Nelson & Marshall, 11 *Upper Sackville-street, Dublin*.—For their cartes de visite.

Cranfield, T., *Grafton-street, Dublin*.—For his artistic arrangements of portraiture.

Silvy, C., 38 *Porchester-terrace, London*, W.—For artistic excellence.

Hennah & Kent, 108 *King's-road, Brighton*.—For artistic merit.

Cooper, H., Jun., 5 *Aberdeen-park, Highbury, London*, N.—For his good manipulation.

Wane, M., *Douglas, Isle of Man*.—For artistic merit.

Manchester Photographic Company, 14 *Ridgefield, Manchester*.—For the interesting collection contributed by its Members.

Turner & Everitt, 3 *Cheapside, London*, E.C.—For good manipulation.

Good, F. M., *Western-road, Hove, Brighton*.—For good manipulation.

Brownrigg, T. M., *Constabulary Office, Castle, Dublin*.—For good manipulation.

Warner, W. H., *Ross, Herefordshire*.—For good manipulation.

Sanderson, W. D., 2 *Mulberry-street, Manchester*.—For good manipulation.

M'Lean & Haes, 7 *Haymarket, London*, S.W.—For their interesting series of instantaneous pictures of wild animals.

Piper, J. D., 24 *Silent-street, Ipswich*.—For excellence of manipulation.

Bullock, Bros., 20 *Lower-parade, Leamington*.—For artistic composition.

Sedgfield, W. R., *Kingston-on-Thames*.—For good manipulation.

Penny, G. S., 14 *Rodney-terrace, Cheltenham*.—For good productions by the tannin and malt process.

Currie, F. E., *Lismore Castle, Lismore*.—For good manipulation.

Cameron, Mrs., *Freshwater-bay, Isle of Wight*.—For artistic composition.

Haines, H., 82 *Grand-parade, Cork*.—For good manipulation.

Wardley, G., 10 *St. Ann's-square, Manchester*.—For good manipulation.

Jones, B., *Selkirk-villa, Cheltenham*.—For good productions by the tannin process.

Coghill, Sir J. J., Bart., *Glen Barrahane, Castletownsend*.—For good manipulation.

Collis, J., 2 *Richmond-terrace, London*.—For good manipulation.

Frith, F., Jun., *Reigate.*—For good manipulation.

Bull, J., *Anglesey-villa, Cheltenham.*—For good manipulation.

Watkins, H., *Regent-street, London*, W.—For good manipulation.

Smith, J. S.—For good productions from paper negatives.

Canada.

Board of Works, *Quebec.*—For the collection exhibited by them.

Henderson, A., *Montreal.*—For his good manipulation.

Henry, C. S., *Lennoxville.*—For his good manipulation.

Notman, *Montreal.*—For his good manipulation.

India.

Buxton, E. C.—For his interesting collection.

Nova Scotia.

Chambers.—For good manipulation.

O'Donnel.—For good manipulation.

Parish.—For good manipulation.

Victoria.

Cornell, F., *Melbourne.*—For good manipulation.

Nettleton, C., *Melbourne.*—For good manipulation.

Austria.

Austrian Museum of Industry.—For good manipulation.

Bavaria.

Albert, J., *Munich.*—For good manipulation.

Böttger, G., *Munich.*—For good manipulation.

France.

Rolloy, Fils, *Hyères.*—For good manipulation in enlargement.

Gillis, T., *Pau.*—For his good production by the tannin process.

Rousset, J., *Paris.*—For good manipulation.

Berenger, Marquis de, *Paris.*—For good manipulation.

Italy.

Barbi & Cinotti, *Gubbio.*—For their interesting application of photography to the reproduction of old inscriptions.

Duroni, Longoni, & Dell'Acqua, *Milan.*—For their skilful enlargement.

Rome.

Luswergh, G., *Rome.*—For good manipulation.

Sweden.

Curenius & Quist, *Stockholm.*—For good manipulation.

SECTION X. (A.)—PHILOSOPHICAL AND PHOTOGRAPHIC INSTRUMENTS.

REPORT.

We have not found in the present Exhibition a large or very varied collection of Philosophical Apparatus, but we are able to report that some of the objects submitted to us are of unusual merit. We would especially direct attention to the unrivalled photographic lenses exhibited by Mr. J. H. Dallmeyer; and more particularly to a new triple meniscus, by which a landscape subtending at the camera as wide an angle as 70°, can be photographed with extraordinary fidelity, though not free from distortion; and to another combination producing more limited pictures, which are in a very remarkable degree free from distortion, and of great and equable beauty throughout their whole extent.

We are unable to make any report in regard to the Photographic Apparatus exhibited by E. Liesegang (*Zollverein*, 49), as it has proved impracticable to make a sufficient examination of the lenses in the absence of photographs taken by them.

We regret that the leading continental instrument makers have not been exhibitors in this department.

H. LLOYD,
G. JOHNSTONE STONEY,
DAVENPORT CROSTHWAITE.

List of Awards.

MEDAL.

Dallmeyer, J. H., 19 *Bloomsbury-st.*, *London*, W.C.—For photographic lenses, and especially for his wide-angle landscape lens, and his triple achromatic lens free from distortion; and **Honourable Mention** for his photographic cameras, portable telescopes, and tripod table-stand.

HONOURABLE MENTION.

Meagher, P., 21 *Southampton Row, High Holborn, London*, W.C.—For his pantoscopic camera, tourists' stereoscopic cameras, and for general excellence of workmanship.

Ottewill, Collis & Co., 24 *Charlotte-terrace, Barnsbury-road, London*, N.—For workmanship of photographic cameras.

Solomon, J., 22 *Red Lion-square, London*, W.C.—For a steady photographic stand, a magnesium lamp, a large woven background, and several convenient photographic appliances.

From the report of Section II., Chemical Processes, we make the following extract as being interesting to photographers:—

Perhaps there is no section that embraces such a mixture of different classes of exhibitors as Section II. One of them is a photographic firm, and as there is a special section for photography, it at first sight might appear strange that they compete in Section II.; but they appear as manufacturers of photographic collodions and other chemicals, also as the inventors of a new photographic chemical process. It is with much pleasure that the reporter is enabled to treat in a few words of the inventions of such importance as are here exhibited by Messrs. Mawson and Swan (*United Kingdom*, 27). There have been two *desiderata* in connexion with photography, each of which has been, from time to time, the *summum bonum* of photographic ambition. One was the printing in carbon, so that the picture might be permanent, and the other the fixing of the natural tints in the picture. The first we may consider as accomplished by Mr. Swan—not only accomplished, but worked out with such results that the most fastidious cannot cavil. This process is based upon the fact that gelatine, containing a small quantity of bichromate of potassium, is rendered insoluble when submitted to the chemical action of the sun's rays. All attempts in this direction had hitherto failed, as no half-tones were produced. The specimens shown are beautiful in the extreme. The liability of photographs to fade has tended more than anything else to narrow photography as an industrial art. Messrs. Mawson and Swan also show collodion remarkable for extreme sensitiveness, and yet having been more than six months iodized. They also show collodion for glazing pictures, and also for fixing crayon drawings (a new idea). Also a new application of Mr. Wharton Simpson's "collodio-chloride of silver" for glass painting. Mr. Simpson's original preparation would not do for this purpose, and we believe the preparation shown contains citric acid.

MEDAL.

Mawson & Swan, *Newcastle-upon-Tyne.*—For photographic collodion.

In reference to the last statement in the above Report, we may remark that it scarcely explains the actual facts. We had the opportunity of seeing excellent photographs on opal glass produced with collodio-chloride prepared according to the original formula of Mr. Simpson, which appeared in the Journal for March. Mr. Swan did, however, subsequently make some slight modifications of the collodio-chloride intended for use solely on glass, which has, we understand, been found useful. Citric acid was first employed in the collodio-chloride by a gentleman known to the photographic world as "The Photographer's Assistant."

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On Stereoscopic Phenakistoscopy.

To the Editor of the Photographic Journal.

23 Somerset Street, Portman Square.

Sir,—The interesting paper by Mr. Claudet on Stereoscopic Phenakistoscopy, reported in your last issue, does not mention the dates when he made his own early experiments, or when M. Duboscq endeavoured to effect a combination of the phenomena respectively produced by the stereoscope and phenakistoscope; nor does Mr. Claudet state how far these experiments proved successful.

Whilst reading his paper, it came vividly back to my recollection that the results described, and the difficulties mentioned, were discussed by Mr. Henry Mayhew and myself some years ago. At that time (1859) Mr. Mayhew obtained a photographic phenakistoscope, which worked admirably. It was a bowing figure; and as the legs retained the same position throughout the successive movements, the difficulty of varying velocity at different diameters was obviated.

I wrote to Mr. Mayhew on the subject. His reply is so interesting that I have obtained his permission to forward it to you without alteration, should you deem it suitable for insertion. It may not be generally known to your readers that Mr. Mayhew has, for many years, devoted his leisure time to the investigation of scientific subjects, bringing to bear on them the full force of proficiency in knowledge and originality in research.

Yours truly,
Henry G. Wright.

Dear Doctor,—I heard nothing of Mr. Claudet's paper on the possibility of producing a series of phenakistoscopic figures by means of photography, nor yet of the probability of rendering such appearances more life-like by means of the stereoscope.

You are quite right, however, that in the year 1859 I carried out a similar idea with perfect success. Indeed I should then have registered or patented the invention, but I was given to understand, at the time, from Mr. Kilburn, that Mr. Claudet had already perfected some such apparatus for attaining the same end.

The plan I adopted was as follows:—I got my brother to produce six stereoscopic portraits of myself in the different gradations of bowing. In the first picture the hand was just raised to the hat; in the second, the hat elevated slightly above the head; in the third, the body was partly bent, and the beaver brought halfway down; and in the fourth, the bow was completed, and the hat within a short distance of the ground,—the two remaining pictures for producing the upward or reverse motion being merely duplicates of the second and third above mentioned.

The phenakistoscopic effect was produced in this wise:—I prepared a kind of paddle-wheel in card-board, with half a dozen floats to it, and upon the front of each of these six floats I pasted *one* of the stereoscopic pictures—say that intended for the left eye. This done, I proceeded to stick the pictures for the right eye on the *back* of the floats in such a manner that the two corresponding stereoscopic pictures were on the same line of diameter, and consequently always presented to the eyes whenever the wheel was held horizontally, with the spectator immediately facing it. By this means—as well as by arranging a small screen in front of the apparatus so as to exclude the foremost floats from the view—the spectator was made to see at one time only the two stereoscopic pictures which were pasted on the floats immediately in front of him; so that when the wheel was caused to revolve on a horizontal plane, and the other pictures came to be presented successively, and but for a moment, to the sight, the effect produced, on combining the two opposite pictures by long squinting, was that of a perfect little doll-like figure of oneself performing a series of the most polite corporeal inflections.

The toy was shown to many of my friends

at the time, and those who were accomplished in the elegant art of squinting never failed to see the same life-like movements as myself. I thought at one time, in the flush of the discovery, that pleasing phenakistoscopic portraits might have been produced with success, and that likenesses of ladies made to go through the amiable pantomime of kissing their hand to the spectators, and of others performing all the movements of flirting a fan, &c., might have had a chance of becoming popular from the mere novelty and curiosity of such things. But I soon discovered that the range of subjects was too limited to admit of any great variety being given to the actions, and moreover that the number of pictures necessary to be taken for each particular result would make such living and moving portraits far too expensive for them ever to become general.

While experimenting in this direction, I tried whether it would be possible by means of the phenakistoscope to realize all those effects of apparent motion in a landscape which are the result of real and rapid movement on the part of the spectator, and whether, by reproducing such effects artificially, an idea of such rapid movement could not be impressed upon those to whom they were presented. While travelling in a railway-carriage the entire country before us seems to be thrown into a perfect series of gyrations, the objects in the foreground appearing to move rapidly in the opposite direction from ourselves, and the background to journey slowly with us, while the houses and trees in the mid-distance have the effect of being stationary. Now, by means of adapting the number of figures to the apertures in the phenakistoscope, it is well known that we can give either an apparent backward or forward movement to such figures. I availed myself of this feature, and endeavoured by such means to produce a series of landscapes, which, when viewed phenakistoscopically, should appear to go through precisely the same series of gyrations as the country seems to do from the window of a railway-carriage. I succeeded in realizing the effect in a rude kind of way; but, I regret to say, my mountains in the extreme distance would travel at such an express speed, that they seemed almost to be running a race with the trees in the immediate foreground, so that it was impossible to say whether a sense of movement was really induced by such means in the spectator.

The experiment, however, strikes me as being well worth repeating, the means of producing an illusion of motion being, to my mind, quite as curious as the conditions determining the illusion of solidity. We now know the perspective requirements necessary for impressing us visually with a sense of stereosity; but we do *not* know what similar requirements are necessary for producing a sense of movement in ourselves. The phenakistoscope has as yet been restricted merely to the production of apparent motion in still objects external to us; but does it not admit of being applied to the bringing about the same effect in ourselves? Who has not had a vivid impression of the delights of flying in his dreams? The phenakistoscope *ought* to be able to make us feel all the charms of rapid transit while sitting at ease in our chair. I must leave it, however, for you, Doctor, to work the problem out in your scientific leisure. You, I know, delight in such elegant pastimes; and the next time I have the pleasure of seeing you, I shall expect you to make me believe I am going up in a balloon, even though I know I am snugly ensconced with you in your own study.

Believe me to be,
Yours in all sincerity,
HENRY MAYHEW.

Dr. H. G. Wright, M.D., &c.

Photography and the 'Popular Science Review.'

We have always pleasure in bringing before our readers the comments and opinions of the unscientific press of the country on photography, and it affords us still greater pleasure to reproduce the articles which appear in the contemporary scientific but non-photographic press. The 'Popular Science Review,' a cheap quarterly journal of science, which has been gradually gaining ground in public estimation during the few years in which it has been issued, has always devoted a certain portion of its pages to a record of the progress of photography. The last number, issued on the 1st of October, contains an article by the editor, Dr. Lawson, marked by a genial appreciation of the importance of our art, which will be extremely interesting to the general reader. Another portion of the same number contains, however, something intended for a *résumé* of the progress of the art during the quarter, manifestly written by another and much less competent hand. This is characterized by so much ignorance, and so much misstatement, that it puzzles us to conceive how such ludicrously silly errors could find admission into a scientific serial. There is, moreover, a vulgar personality of tone calculated to lower generally the character of the journal in which it appears. Take as an illustration the statement made in the first paragraph of the photographic *résumé*, that Mr. Fox Talbot has the merit of first pointing out "that gelatine, when dissolved in hot water, if mixed with bichromate of potass or ammonia, dried, and exposed to the action of light, would become insoluble." Now if any fact in the history of photography be better known, more completely established, and less free from suspicion or doubt than another, it is that the discovery that organic substances combined with a bichromate become insoluble under the action of light was due to Mr. Mungo Ponton, who published his discovery in the 'Edinburgh Philosophical Journal,' in the year 1838—one year before Mr. Fox Talbot had made any announcement of photography at all, and several years before he devoted his attention to the action of gelatine and bichromates. This is a fact which, until now, has not been either doubted or denied. The remark we have quoted occurs in a bad epitome of an article abstracted, without acknowledgment, from the pages of a contemporary, of Mr. Woodbury's process.

The next paragraph, furnished as a portion of the progress of photography during the last three months, is the announcement that Professor Miller, well known to scientific men as the able Professor of Chemistry at King's College, is the "American author of a recently published work on chemistry," and that he has been engaged in a series of experiments on the photographic transparency of bodies. These experiments, referred to as novelties, were detailed at the Royal Institution upwards of two years and a half ago.

The next "novelty" is still more comical than those to which we have referred. We are informed of the recent discovery of an American gentleman, of a method to obviate the tendency which some collodions have to form wavy lines when the plate is coated, which remedy consists in the addition to each ounce of collodion of "ten drops of chloroform"! It must be familiar to every photographer of any standing that this remedy was proposed at the Photographic Society, by Mr. Shadbolt, at least ten years ago, and published at that time in all the existing photographic journals. As a harmless piece of empiricism, it attracted some little attention at the time, but soon passed out of use as effecting neither good nor harm. That such a suggestion should have been made in the early days of the art, when little of the nature of its agents was known, is not, perhaps, surprising, but that it should be revived, ten years afterwards, in a scientific quarterly journal is something as preposterous as it is lamentable. The explanation, however, is simple; the compiler of this summary abstracts his matter, and, as we have before said, without acknowledgment, from any source to which he has access; but, being profoundly ignorant of the subject on which he writes, he compiles without discrimination, exercising no winnowing operation, and, by the bad luck which often attends the incapable, he stumbles on blunders more frequently than on facts. We should not have felt it necessary, perhaps, to speak so strongly of honest ignorance, however inexcusable in such a place, if we had not also noticed the presence of a petty spite and personal feeling which renders the "Summary" clearly traceable to one source. This is manifested by several of the comments, and especially by the misstatements and false suggestions made in reference to the recent North London awards, into the details of which, as they possess no scientific interest, we have neither space nor inclination to enter.

Turning from this unsatisfactory portion of the 'Popular Science Review,' we revert with pleasure to the genial and appreciative article of the editor, on "Photography and some of its Applications." The best commentary we can offer on this article will consist in presenting a few extracts which will interest our readers:—

> Of the applications of photography to the *fine arts* there are two or three that are especially worthy of notice—*photosculpture*, the *crystal-cube miniature*, and the *burnt-in photographs in china and glass*. Of these, the first, which is the invention of M. Willième, a Frenchman, is perhaps the best known in England. M. Claudet, who tried to introduce photosculpture into these countries, has taught us all about it, though we fancy he has not found the invention valuable in its commercial bearings. To those unfamiliar with the processes of photosculpture it is almost impossible to conceive that by any photographic appliances a perfectly solid bust of a sitter can be obtained. Yet is it quite true that photography is capable of doing all that M. Willième contends for. We may observe, however, that the sculptor's chisel is brought into operation, and that though the greater part of the work is chemical and mechanical, the hand of the artist is required to give those finishing touches, which no mere physical contrivances could effect. The principle of the process of photosculpture is based upon the fact, that a solid image is nothing more than a multitude of profiles placed side by side like the radii of a circle. If a sculptor was acquainted with the exact nature of each of those profiles, his work would be easy enough. Let us see how M. Willième utilizes this fact. The person whose bust is desired is placed in the centre of a circular room in whose walls, at equal distances from each other, are twenty-four cameras; at a given moment the photographers expose the plates, and thus simultaneously twenty-four different views are taken of the sitter. The outlines of these constitute as many profiles, which are brought to the assistance of the sculptor in the following manner. The glass slides containing the figures are placed in a sort of magic-lantern, and are succ

thrown upon a ground-glass screen, behind which sits the sculptor with his block of plaster before him. This block is placed upon a revolving disk, which is graduated. There is also behind the screen an instrument called a pantograph, which we cannot further describe than to say that it is a piece of mechanism, which, in this case, has a style attached to one extreme and a sculptor's chisel at the other, and which is so contrived that as the style traces the outline of the figure projected upon the ground-glass screen, the chisel carves out a corresponding outline upon the block. So far, then, the reader can understand, that as soon as the first photograph is placed in the lantern, its image is projected on to the screen, and the sculptor, working with pantograph, traces out the outline upon the glass and simultaneously chisels out the first profile on the block. As soon as this has been done, photograph No. 2 is placed in the lantern, the graduated disk on which the block rests is turned round 1–24 of its circle and the second profile is carved out. These operations are repeated till the whole twenty-four photographs have been used and as many profiles cut out upon the block, which has by this time described a complete revolution. The consequence of all this is a bust, which, when it receives a few touches from the hands of a skilled sculptor, is completed. Such is the process of photosculpture; and though, at first, the idea of a solid bust, produced by photography, seems very remarkable, when the details are explained much of our wonderment ceases. We believe we are correct in stating that the discovery has not proved valuable in a pecuniary point; the great expense of the preliminary operations and of employing skilled artists to complete the bust having rendered it inaccessible to all but the wealthy. * * * *

The public have not seen, as yet, many of the photographs produced by the "burning-in" process; but no doubt they will soon be familiar enough with these handsome and really important applications of the science of sun-printing. Some of these, which were exhibited at the last *conversazione* of the Royal Society, were extremely pretty. When examined by reflected light, they gave one simply the idea of a plate of white or opal-like china, having a rather indistinct picture upon, or rather slightly beneath, its surface; but as soon as they were placed so that the light passed directly through them, the picture assumed a prominence and elegance of finish which could hardly have been anticipated. They are prepared by what is termed the *burning-in* process, a method whose nature is expressed in its name. The photograph may be burnt into either glass or porcelain, but must be taken in a special manner. The plate must first be coated with a varnish of benzole, india-rubber, and collodion, and on this the sensitized collodion must afterwards be placed. When it has been exposed in the camera, the image requires to be developed, strengthened, and washed, according to prescribed processes which we have not sufficient space to describe. After these operations have been gone through, the plate is immersed for some hours in either a bath of platinum, if it be desired to have the picture of a greenish-black tone, or in solution of chloride gold, a golden tint is required. The image is now washed, either with a solution of cyanide of potassium or with strong ammonia, and it is then covered with a thick varnish of india-rubber, and heated in a "muffle." The organic matter is thus destroyed, and a purely metallic picture remains upon the glass. The only thing to be done now is to vitrify this image, and this is effected by means of a flux of either borax or silica. The most important feature in connexion with these photographs is their permanency; the pictures are painted in pure metal, and this by its vitreous envelope, is entirely removed from the action of the air, moisture, &c. Hence there is every reason to believe that such photographs will remain unchanged for ages; and if such a belief be correct, it is most probable that a thousand years hence photoportraits of our Carlyles and Tennysons will figure in the National Galleries of the period. * *

Of all the useful labour which photography has done for man there is, however, no one feat which she has accomplished more extraordinary than that by which she records the results of the philosopher's investigations. The story of Aladdin's lamp—that glorious tale of the "Arabian Nights" —which used so to excite our boyish emotions, told us of no greater wonders than those of photography. The mysterious "genius of the lamp" —that strange being whose powers were so unlimited—was but the prototype of another spirit—actinic force—which promises even greater marvels than those achieved by its eastern predecessor. When we inform our readers that the night-work at the Greenwich Observatory is now abolished, and that through the long dreary hours when the human world is at rest, photography is silently and steadily recording the phenomena of the physical universe, our Spirit of the Lamp ceases to be mythical. It would be impossible in the limited space at our disposal to enter upon a description of the immense variety of contrivances employed in the "Observatory" for recording the variations in the movement of the several instruments which such an institution possesses; but we shall give an account of the means by which the movements of the magnetic needle are handed down to us by photography. The needle is so suspended that the apparatus suspending it carries a small concave mirror of long focus, which moves uniformly with the needle itself. Placed opposite to this is a lamp (gas or photogen), through a narrow slit in which a bright spot of light falls on the mirror. At a distance of about twelve feet from the latter there is a piece of mechanism, comprised of a cylinder bearing photographic paper, and attached to a strong time-piece, so that it revolves slowly in twenty-four hours. The light which passes from the lamp travels to the mirror, and is reflected by it (the rays having previously been made parallel by a lens) on the slowly-revolving cylinder. As the magnet moves slowly to the east or the west, so does the mirror, and so also does the spot of light upon the paper; and the consequence is, that at the end of the twenty-four hours the paper, when removed from the cylinder, contains a series of curves which pass to the right or left of the centre, and thus indicate with the utmost exactness the movements which the needle has performed. In the case of the barometer a somewhat similar device has been employed; but in this case the mirror has been dispensed with. The light is allowed to traverse the barometer before passing on to the prepared paper, and as it can only pass at a point above the level of the mercury, the elevation or depression of this fluid is thus made to register itself. Thus, in the case of these several instruments does photography all the night long perform its useful office, and confer benefits on mankind which only those who know the value of accurate scientific statistics can appreciate. We may mention, in passing, that the means of employing photography in the "Observatory" are due entirely to the inventive mind of Mr. Brooke, a gentleman whose name our microscopic readers have often met with. Science has also profited by sun-pictures of the moon, of great eclipses, of the dissected body, and, through the medium of the ophthalmoscope, of the interior of the human eye.

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Photography without a Nitrate-of-Silver Bath.—Wet and Dry Negative Processes with Collodio-Bromide of Silver. By B. J. SAYCE.

IN September 1864, I published a process by which negatives could be obtained in a simple and certain manner, without the aid of a nitrate-of-silver bath. Since that date I have not in one single instance made use of the bath, and have experimented upon upwards of 200 plates with unvarying certainty and cleanliness, accompanied by a considerable saving of *labour, time,* and *expense* in the preparation of the negatives.

Although the formulæ first announced will be found to work as at the time it was made public, I have since adopted some slight modifications, and the following contains the mode of manipulation which I would recommend to those interested in the process:—

Preparation of the Collodion.

Take bromized collodion, containing 8 grains of bromide in each ounce; mine is prepared as follows, and is that which I have used for two years and a half with a 60-grain bath for rapid exposure:—

Bromide of cadmium	6	grains,
Bromide of ammonium	2	„
Soluble pyroxyline of fair ordinary quality	6	„
Ether	½	ounce,
Alcohol	½	„

Prepare as much as required, and, when mixed and allowed to stand for a week, then pass through a retort-filter. The filtration is not absolutely necessary, but I find it a certain cure for the transparent spots respecting which so many complaints were made last summer.

When the above bromized collodion is ready for use, take crystallized nitrate of silver 12 grains, reduce it to a *fine* powder in a glass mortar, and then add one or two drops of water, or say sufficient to produce a kind of pulp; then, in a yellow or non-actinic light, mix the collodion with the silver, stirring with a glass rod or pestle, as the mixture is being poured into the bottle intended for its reception, then shake up well, and allow to stand.

In an hour it is ready for use, and should be decanted into another bottle for use in coating the plates. It has been suggested that the nitrate of silver should be dissolved in alcohol, and then mixed with the collodion. This plan, doubtless, would work well, but I prefer to be satisfied that the bromized collodion is in perfect condition before adding the nitrate of silver, for afterwards I do not believe it possible to remove any defect in the preparation.

Another mode of producing a collodion for use without a bath is by forming bromide of silver by precipitation from aqueous solutions of bromide, potassium, and nitrate of silver, then washing the precipitate in alcohol until water is eradicated, and adding to plain collodion sufficient to produce a creamy film.

To render this method most successful it is desirable to add to the collodion a few drops of an alcoholic saturated solution of bromide of cadmium. I do *not* adopt this mode of preparing collodio-bromide of silver, but give the suggestion for the use of those who may make the experiment.

Having tried each way, I prefer the original method, *i.e.* that of adding nitrate of silver to bromized collodion in the proportion above mentioned; and fortunately it boasts of a further advantage, viz. that of occupying less time in practice than in description.

Use of the Collodion in a Wet State.

Take a perfectly clean plate of glass free from scratches, tip the edges for an eighth of an inch with a solution of 1 grain of india-rubber in 1 ounce of benzine, and then coat with the collodio-bromide of silver, allow to set the usual time, and then place in a dish of water until the greasy appearance has vanished.

If *warm water* can be obtained conveniently, use it in preference, there being a great saving in time, and the plates are more sensitive.

When the water flows freely over the film, take the plate out of the dish, wipe the back, and drain for a moment upon a piece of blotting-paper, then place in the dark-slide for exposure in the camera.

Expose a little longer than wet collodion with nitrate bath before development, wet the film with a little water, and pour over

Protosulphate of iron	25 grains,
Glacial acetic acid	25 minims,
Water	1 ounce.

to 3 drachms of which add 2 drops of solution of nitrate of silver, 20 grains to 1 ounce of distilled water.

The image appears quickly, and in every respect like an ordinary wet plate, and a few trials will show the proper exposure.

Intensification may be accomplished by any of the methods adapted to wet plates,—and the fixing with cyanide of potassium, 20 grains to the ounce of water.

Use of the Collodio-Bromide of Silver in the preparation of Tannin Plates.

Coat a clean plate of glass, previously nipped at both edges with india-rubber in benzine, with collodio-bromide of silver, and when the film has set, place in a tank of water; then coat another plate, which also place in the tank until the number required is completed.

Then have ready a dish of water from the kettle, as hot as the hand can bear. Take the plates out of the tank in rotation, and place them in the hot water for about thirty seconds, and then in a bath of tannin solution, 15 grains to the ounce of water, well filtered, or in the following solution, suggested to me by Mr. Verity, of Manchester, which I find superior to the ordinary tannin solution, viz.:—

Tannin	10 grains,
Gallic acid..............	5 ,,
Water	1 ounce,
Grape sugar	5 grains,
Alcohol	10 minims.

Prepare *quantum suff.* as follows:—Dissolve the tannin in a portion of the water, and filter; dissolve the gallic acid by heat in another portion, and, when filtered, mix with the tannin, then add the grape sugar, and again filter; the alcohol may now be added, and it is ready for use.

If the plate is allowed to remain in the above solution three minutes, and is properly exposed, very little intensification is necessary.

When ready, take out the plate, and drain and dry evenly and quickly in any convenient and suitable manner. I have a drying-box with hot water over, the plates standing in racks, and the whole closed up with a door.

Expose about one half the time required for tannin plates with bromo-iodized collodion.

Development.—Prepare the following solutions:—

No. 1.—Alcohol	½	ounce,
Water	½	,,
No. 2.—Carbonate of ammonia	40	grains,
Water	20	ounces.
No. 3.—Pyrogallic acid	96	grains,
Alcohol	1	ounce.
No. 4.—Bromide of potassium	10	grains,
Water	1	ounce.
No. 5.—Nitrate of silver	30	grains,
Citric acid	15	,,
Distilled water	1	ounce.

Pour over the dry plate once or twice sufficient of No. 1 to cover it, and then return to the bottle for use with the next plate.

Then place in a dish of water until the greasy appearance has vanished.

Then pour over evenly sufficient of No. 2, with a few drops of No. 3, and two drops of No. 4 added, and wave *to* and *fro* with a rocking motion.

The image should very soon appear, and may be developed until the *shadows* become *slightly* tinged, then wash surface and back of plate freely with water, and rinse surface and back with a little very dilute acetic acid (say two drops glacial acid to 1 ounce water), wash off the acid; and if any intensification is required, it may be effected by adding to (say) two drachms water three drops No. 3 and three drops No. 5 solutions.

When sufficiently dense, wash and fix with cyanide of the same strength as for the wet plates, and wash thoroughly afterwards.

Strong cyanide solution answers better than weak. When the latter is used, I have found a tendency in the films to split up on drying, which has not happened when strong cyanide has been used.

The above is an unreserved statement of the process by which I have worked, and is accompanied by prints from negatives produced by it, which probably the editor will criticise according to their merits; they are only the productions of a hurried trip in the Lake district, and from untouched negatives.

I shall be happy to furnish through you any further information that may be of assistance to those who give the process a trial.
—*Photographic News.*

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Herr Wöthly's Formula for Negatives.

WHEN we first heard of the Wöthlytype, we were informed of the extreme beauty of the negatives from which his prints were taken; and having been permitted to inspect them, were astonished at their delicacy and great excellence. Colonel Wortley has published the following details of Herr Wöthly's manipulation in the 'News.' We heartily hope that the Association which holds his patent may meet with the same degree of success which has attended the discoverer of the process.

"*The Collodion.*—In 4 lbs. of alcohol, of from 90 to 95 per cent., dissolve 680 grains of iodide of ammonium, 240 grains of bromide of cadmium, and 120 grains of iodide of cadmium.

"To the solution add 5 lbs. of absolute ether and 2¾ ounces of pyroxyline, and agitate until the cotton is dissolved; then add 1 drachm of distilled water, and leave the whole to stand a few days to settle. This collodion is very sensitive, and may be kept for some months without loss of sensitiveness.

"A common fault in the manufacture of collodion is the addition of too small a proportion of pyroxyline, and the collodion is consequently too thin; and this is the reason that the negatives do not readily acquire sufficient density. By adding a little cotton to a thin collodion, the photographer may readily ascertain its importance in conferring vigour on the negative. It may happen that even collodion prepared after my receipt does not produce the desired effect, in which case a further addition of pyroxyline is necessary, continuing the addition until the desired result is obtained. I own, therefore, that it is not possible to state the unfailing proportion of pyroxyline, from the slight variations which exist in its quality. We have the means, however, of correction by making additions until sufficient strength in the negative is gained.

"The proportion of ether and alcohol must not, however, be changed, as a larger proportion of alcohol, for instance, would tend to produce weak pictures. Thick collodion has, beside, the advantage of securing on defective plates good negatives. The collodion should be poured slowly and quietly on the plate, in order to produce an even, thick, and perfect film—a condition of the first importance in securing a clean and perfect negative. It is important for this and all photographic operations that the temperature of the laboratory should be kept at about 15° or 16° Réaumur: any deviation from this will interfere with the production of good negatives.

"*Preparation of the Silver Bath.*—Dissolve 1 lb. of double crystallized nitrate of silver in 12 lbs. of distilled water. Next dissolve 5 or 6 grains of iodide of ammonium in 1 oz. of distilled water. Add this to the silver solution and agitate; the turbidity caused at first will disappear in an hour, and the solution will become clear. When clear, *but not sooner*, the silver bath must be carefully filtered. Now add to it from 10 to 15 drops of chemically pure nitric acid. It is very important to add the acid in the order above mentioned, after the iodide of ammonium has been added and the solution filtered, as otherwise a larger proportion of iodide of silver will be dissolved than is necessary to the satisfactory working of the bath; in which case a larger proportion of nitric acid will be necessary to avoid any tendency to fog or mistiness, and this will sometimes cause the film to leave the plate. Any addition of acetic acid to the bath is not to be recommended, as it diminishes the sensitiveness.

"When, after a lengthened use, the silver bath no longer produces the desired result, from the accumulation of double salts, iodide of silver, &c., dilute it with half its bulk of distilled water, and after allowing the precipitated iodide of silver to settle for a few days, filter it, then evaporate on a water-bath to its original bulk; this removes ether and alcohol as well as water. Again filter, and add a few drops of nitric acid and a small quantity of a saturated silver solution, and the bath will be again ready for use. Should there be any tendency to fog, add a little more nitric acid. It will have become obvious to the reader by the above remarks that an acid reaction in the bath, sufficient to turn litmus-paper red, is desirable. The presence of large quantities of ether and alcohol produces streaks and stains, and the evaporation is valuable in removing these bodies.

"*Developing Solution.*—First prepare a *perfectly saturated solution* of sulphate of iron in water, and filter. Of this (which may be kept prepared for many months, a large quantity being made at once) take 2 ounces and add to it 1 lb. of distilled water, and then add a quarter of an ounce of acetic acid and one ounce of alcohol. The use of a saturated solution of the sulphate of iron not only has the advantage that the developer is quickly and easily prepared from it, but it also acts more satisfactorily than a newly mixed solution, especially if the saturated solution have been exposed for some time to the sun. Cover the plate evenly and gently, so as not to wash the silver solution off the part whereon the developer is poured. The image will appear slowly, gradually acquiring strength and harmony. When sufficiently intense, wash and fix in hyposulphite of soda. Should the negative lack vigour, it should be strengthened in the following way:—When the image is perfectly brought out, pour off the developing solution and flood the plate carefully with the following solution:—

Nitrate of silver	½ ounce,
Distilled water.	1 lb.,
Alcohol	1 ounce.

"When this has been kept on the plate about a minute, and flows quite evenly, pour it off, and apply a fresh portion of the developer, repeating the operation, if necessary, until sufficient density is obtained, then wash and fix. The negatives for the Wöthlytype should be more vigorous than those for albumenized paper."

The Relation of Photography to the Fine Arts.

By John Moran*.

Although the claims of photography to membership in the family of fine arts have been often pleaded with warmth and skill, they are still denied; the present occupants of the temple of beauty yet refusing her admission, though the capacities of the edifice are ample, and contain room and verge enough for all.

This refusal to rank photography among the fine arts, I consider, is in a measure unfounded, its aim and end being one in common with art. It speaks the same language, and addresses itself to the same sentiments. It is our simple and unselfish delight in the contemplation of nature, which is the foundation of all the beautiful or fine arts, and which distinguishes them from science or mechanic arts. The cathedral, in so far as it is merely useful, is a work of science; but as it combines other qualities which are addressed solely to the imagination, it is a work of art. Of course, photography can never claim the homage of the higher forms of art; for in the actual production of the work the artist ceases, and the laws of nature take his place. But it is the power of seeing and deciding what shall be done on which will depend the value and importance of any work, whether canvas or negative. Dryden says, "The most important thing in art is to know what is most beautiful." Now this first and most important knowledge the photographer must have, equally with the painter. The exercise of the artistic faculties is undoubtedly necessary in the production of pictures from nature, for any given scene offers so many different points of view; but if there is not the perceiving mind to note and feel the relative degrees of importance in the various aspects which nature presents, nothing worthy the name of pictures can be produced. It is this knowledge, or art of seeing, which gives value and importance to the works of certain photographers over all others. There are hundreds who make chemically faultless photographs, but few make pictures; but though painting calls for talents and capacities not demanded by the photograph, and which necessarily give it a much higher rank, yet that should not exclude our art from the class to which it belongs. There are relative degrees of excellence in all modes of art. From 'Hamlet' to 'Auld Lang Syne,' or the 'Transfiguration' to a chalk drawing, there is a wide interval; yet each is a work of art. A proper classification of photography will be of advantage to all parties, whether maker or buyer. If our works are not art, the sooner we know it the better, that we may turn our best efforts away from the production of beautiful pictures, and study how we can be useful as an advertising medium. The amateur may learn that he is wasting his time, and should sell out at once. The public may learn that they are throwing their money away in filling folios, or decorating parlours.

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* **Read before the Philadelphia Photographic Society.**

There are three heads under which may be classed all the various kinds of human work, namely, Science, Mechanic, and Fine Art. They, again, like light, are capable of further subdivision. Now, photography is certainly a human work, and must therefore come under the wing of one of the three. As a branch of science it does not seem to fulfil the requirements of either form of science, *i. e.* the speculative or practical. In the first, knowledge is its only aim; but, if pursued for some ulterior end, it is called practical, or, as the Germans say, bread-and-butter science. Geology may be studied as a means of tracing the history and changes of the earth's crust, or as means of developing coal-beds or coal-oil; but though a little science be necessary to the production of photographs, and they, again, may be some aid to science, yet the motives which induce the highest aims of photography, an end which it accomplishes (the delineation of the external aspect of nature), have nothing in common with the aims of science. We may therefore dismiss its claims under that head, and see what fellowship photography holds with mechanics. A mechanical art I define to be "a physical means to a materially useful end." Physical utility is its distinguishing mark; but the best and most beautiful photograph may claim the preeminence of being as useless as even the Apollo Belvidere; so that, tried by a utilitarian test, we have but frail chances of admission to the workshop.

We thus find, negatively, what photography is not. Our next consideration will be, what are its positive claims and analogies with works of art?

There are three dogmas of art by which it may be tried, namely, Imitation, Truth, and Beauty.

1. Imitation.—Quatremère De Quincy thus defines imitation in art:—"To imitate in the fine arts is to produce the resemblance of a thing, but in some other thing, which becomes the image of it." That condition the photograph fulfils to the letter.

2. Truth.—The word truth, as applied to art, does not mean necessarily the full and complete record of all the phenomena existing in an object, but concordance with the object in what is stated. The statue-engraving, ink-drawing, or photograph, though all lack colour, are still true representatives, in so far as they go. All human truth is but relative; so that the failings of the photograph, as compared with the painting, do not exclude it from the fine arts, because its utterance is limited; besides, the manner of its production is confirmation of its truth.

The third ordeal will be, Can photography produce works which call forth the ideas and sentiments of the Beautiful? I hold that she can; but to a better understanding of the way in which this is accomplished, it will be necessary to look into a knotty question or two, touching the relation of mind to matter. Philosophers tell us that it is through the agency of the senses by which we attain to knowledge and ideas of external nature and its various phases. It is our delight. In the contemplation of these ideas, upon which are founded all the imitative arts, the form, colour, and activity of nature are a never-ceasing source of wonder and interest to us. Now, it is the proper business of art to produce those images of nature which call into active power that class of thoughts which we denominate "feelings of the beautiful," "theoretic ideas," "æsthetic faculties," and many other names, which all mean the same thing. I therefore take beauty to be simply a name given to a certain class of feeling, which may be called into action by form, colour, or symbol. Now a faithful image of combinations of nature, which are pleasing or beautiful, will similarly affect us, though much less in degree, where there is great capacity of mind. The real mountain is a nobler object to Byron than the painted one.

For the above reasons, I think we may claim for the photograph the ability to create imagery which calls forth ideas and sentiments of the Beautiful.

To recapitulate, photography is not science, for it teaches nothing in that sense. It is not a mechanical art, for it does not produce articles of use; but it fulfils three of the principal conditions of a fine art, all of which, I think, entitle it to rank as a member of the family of fine arts.

Virtually, the great mass of the public do acknowledge it as such, or how else can we explain this immense expenditure of money in transcripts of nature or reproductions of art? What traveller returns from Alpine glacier or Venetian architecture empty-handed? But not only have photographs a value in recalling past scenes or associations, even to the minds of those who cannot meet this far-off nature face to face. She can present imagery with a reality and force nearly rivalling the painter, and in some respects superior.

I will say a few words, not strictly to the question. It is a very common error, that all we need do to see is to look. Even some of our "star lights" seem to have the same opinion; but in looking at works of art we see not alone with the eyes; the object must be illuminated from within; otherwise, all things, whether of nature or of art, are but dead, inanimate matter. We had an example of this mental blindness in Mr. Beecher's late lecture on Beauty and the Beast, wherein he complacently surveys the living British art, and exclaims, with the *sang froid* of Sir Charles Coldstream, "There is nothing in it." But we may well question whether it was the mind or the art which was empty.

> *Hamlet.* Mother, look; do you see nothing?
> *Queen.* Nothing; yet see I all that is.

Mr. Beecher did not suspect the spirit behind the canvas.

To close, I would beg leave to call the attention of the Society to these questions, to the end of a further interchange of opinion; for on these depend the right direction of our individual efforts, and the general advancement and position of Photography.—*Philadelphia Photographer.*

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Gelatine Combinations with the Iron Developer.

By Nelson K. Cherrill*.

Having read, with much interest, the details of the new developers, as prepared by Messrs. Carey Lea and Hughes, I tried a simple experiment in the same direction, the result of which, though nothing new, may be interesting or useful to some of your readers.

It will be at once seen that Mr. Hughes's solution is quite different from Mr. Lea's, for, by the addition of sulphuric acid to gelatine, Mr. Lea forms a solution containing a substance known as *Glycocine.*

This substance, to which, in part at least, the intensity derived is due, is not present in the developer of Mr. Hughes, for acetic acid added to gelatine will not form glycocine, and it is very improbable that glycocine is found, even if there is some chemical action between protosulphate of iron and gelatine; at any rate, if any is found, there can only be a very small proportion of it.

It is very curious that two solutions, each containing gelatine, and one containing besides glycocine, should give a similar result. The subject, probably, if investigated, would lead to some considerable improvements, even upon the now comparatively perfected state of the iron developer.

Three drachms of gelatine were placed in a thin glass beaker, with a very little water, and concentrated sulphuric acid was then added quickly. Of course the temperature rose very considerably. In about five minutes the whole of the gelatine was decomposed, and the resulting brown liquid (brown, probably, through the presence of some form of *carbon*), being diluted to about five bulks with water, was rendered slightly alkaline with liquor ammon. fortis. The quantity to the drachm of converted gelatine, or more properly glycocine, being calculated, a developer was made up as follows:—

Protosulphate of iron	30 gr.
Glacial acetic acid	20 min.
Glycocine, as prepared	1 gr.
Alcohol	10 min.
Water	1 oz.

With this developer, and many modifications of it, I found that fogging was quite out of the question. Plate No. 1 (enclosed) is the result of a most careful attempt to fog a plate after a full exposure, the developer being kept on for about five minutes, the whole picture being out in one minute; after which silver was added to the developer and the action further continued.

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* From the 'Photographic News,' September 1st.

Plate No. 2 was taken with this developer, and not intensfied.

I now made up a developer as follows:—

Iron	about	60 gr.
Glacial acetic acid		30 min.
Gelatine		½ gr.
Glycocine	about	1½ or 2 gr.
Water		1 oz.

This solution did not give much more intensity in my hands than the first one, but flowed over the plate with great ease. With it No. 3 Plate was taken, being slightly intermixed with free silver in the developer.

If any of your readers (not being chemists) wish to try the experiment of making glycocine as described above, one caution may not be out of place. The acid glycocine may be diluted with water to a considerable extent (I have given 5 bulks), in order to make it safe to add ammonia; a serious accident might occur from not attending to this simple precaution.

The result of adding *hot* sulphuric acid to gelatine is still, I think, glycocine; if not, it seems to answer just as well. Glycocine is

$$C_4\ H_5\ NO_4.$$

A description of glycocine, &c., will be found in 'Fownes's Manual of Chemistry,' pp. 522 and 677.

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Collodio-Bromide of Silver and Collodio-Chloride of Silver.—At a Meeting of the Liverpool Amateur Photographic Association, held 29th August, a paper by Mr. Sayce, entitled "Manipulation of Collodio-Bromide of Silver," was read by the President, Mr. Sayce being unavoidably absent; after which details of the process underwent considerable animated criticism, the general opinion, derived from the illustrations exhibited, being that the process is not in any way inferior to any of those where a bath is employed, but, in consequence of possessing advantages peculiar to itself, it might be regarded in some respects as superior. This opinion was further confirmed by comparison of two negatives of a scene near Corwen, one a collodio-bromide plate, the other a plate prepared with a bath by a member of the Association, both plates being exposed on the same day and at the same time. Several prints and negatives, by Mr. Sayce, Mr. Bolton, and Mr. Phipps, were exhibited, and elicited general approval. Mr. G. F. Williams made a few remarks in favour of printing with collodio-chloride of silver, and passed round for inspection prints by that method, which were examined with interest. Mr. Williams had found the toning-baths of acetate of soda and chloride of gold, or sulphocyanide of gold, to answer perfectly. The details of Mr. Sayce's paper appear in the present Number of this Journal.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

THE NORTH-EAST LONDON MEDALS.—We have received from Mr. T. Ross a letter in reference to the Jurors' Report in our last, in which we remarked on the appearance of a letter with his name declining a Medal. He states that the letter which appeared in a contemporary was written by him. As it is explained in the Report that his lenses were not examined for the reasons there stated, and the grounds also explained on which a Medal was awarded to him, it is quite unnecessary to enter into further discussion on the subject. If Mr Ross still feels himself undeserving of a Medal under these circumstances, he is of course quite at liberty to decline it.

C. E. F.—Mr. Mudd makes no secret of the details of his collodio-albumen process; and although, as you remark, it does not follow that equally beautiful results would be produced by the same process in other hands, it is only fair to remember that such results have not been produced by any other dry process in any hands. We believe the collodio-albumen process to be sounder in principle, simpler in detail, and more certain in practice than the tannin process or any other dry process practised. You will find an article by Mr. Mudd on page 178 of the 6th vol. of the 'Photographic Journal.' Some important modifications have been made, however, since that article was published, which are detailed by Mr. Mudd in our contemporary, the 'Photographic News,' page 386, vol. v

Alpha Beta.—"In No. 160, Aug. 15, 1865, you published a process by Dr. Van Monckhoven for enlarged paper positives. As I am only a practical amateur, I wish to know if you would kindly give me, through the medium of your paper, a more distinct translation, as the formula is French. For instance, what is a litre in English measurement? also a gramme, in English, = what? The formula stands thus:—

'One part of pulverized sugar,
One part of sulphuric acid, and
One part of monohydrated nitric acid.

After an action of about five minutes, I remove the mass out of the acid and wash it under a stream of cold water. I next dissolve it in alcohol [how much alcohol?], and precipitate it with water.' Please inform me how the sugar is pulverized, and what kind, as I am very fond of photography. I should like to know your terms for Membership, and whether they must be residents in London or neighbourhood. Hoping it will not put you to inconvenience to give me the particulars of this process."—A litre is 35 fluid ounces; a gramme 15½ grains. Use common pulverized sugar, and a sufficient quantity of alcohol to dissolve it. You will probably succeed better by purchasing nitro-glucose of a manufacturing chemist. The terms of Membership are one guinea per annum, and one guinea admission-fee; but only half-a-guinea subscription should you determine at once to join us, which will free you up to February. We shall have much pleasure in causing your election.

Alexander Nicholson.—This gentleman, who complains of not receiving any answer in reply to his communications, is informed that a letter, addressed as he requested, has been returned through the Dead-letter Office as unknown.

A. H.—A Catalogue of the Pictures of the Amateur Photographic Association has been published by Mr. Melhuish, who will forward it to you in return for eighteen stamps.

No. 163. NOVEMBER 16, 1865.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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PHOTOGRAPHIC SOCIETY.

The next Meeting of the Session will take place at King's College, on Tuesday, December 12th, at eight o'clock, when Mr. Walter B. Woodbury will read a paper "On Photo-relievo Printing," and will practically demonstrate the process.

Meetings of the Society, 1865–66.

1865.	Tuesday,	Dec.	12
1866.	,,	Jan.	9
	,,	Feb. (*Anniversary*)	13
	,,	March	13
	,,	April	10
	,,	May	8
	,,	June	12

We call the attention of those of our readers who take an interest in the curiosities in photographic science to an able and interesting letter by Mr. Claudet, which appears in another page. It is worthy of notice for more than one reason. In the first place it is a model of what letters in the polemics ot science should be. In stating his own claims and establishing his own priority to the discovery, Mr. Claudet has not used one word which could be construed as offensive to any other person concerned in the discussion. He shows that he is more interested in what others have done towards elucidating the question in hand than in magnifying his own earlier discovery and establishing his own originality. The spirit is excellent, and the writing is admirable. In the next place, this communication conveys some very curious information in regard to his own and other very early labours on the application of the optical law relating to the persistence of vision. And, finally, it illustrates how the same idea may occur independently and originally to a number of minds at different periods. Without entering into the history or details of the photographic applications of the thaumatrope or phenakistoscope, we may mention that, besides the early labours of Duboscq and Claudet referred to in Mr. Claudet's letter, an instrument of the kind illustrating machinery in motion was exhibited at a soirée of the Photographic Society in 1861, the invention of Mr. Shaw, who patented it in 1860. Thus we have in 1852 the labours of MM. Duboscq and Claudet, in 1859 those of Mr. Henry Mayhew, in 1860 those of Mr. Shaw; and the editor of our Jersey contemporary has recently reminded his readers that *he* "invented" a similar instrument in the December of 1860. Whether his invention ever had any existence except on paper we are not aware. Some other inventors, doubtless as independent, have also, we believe, described their experiments or conceptions in the same direction; but the field for the practical working out of the ideas which Mr. Claudet has so well described still remains open.

Our present Number contains a mass of interesting matter touching various modifications of the developer in which an organic salt of iron is employed. We have not space to enter into any estimate of the respective advantages of the various methods proposed. We hope in our next to record a few practical experiments we have made in this direction.

LONDON PHOTOGRAPHIC SOCIETY.

ORDINARY GENERAL MEETING.

KING'S COLLEGE, LONDON.

TUESDAY, NOVEMBER 14, 1865.

J. GLAISHER, Esq., F.R.S., V.P., in the Chair.

The CHAIRMAN said he hoped all the Members present experienced the same feelings of satisfaction on reassembling that the Council enjoyed in welcoming them to this, the First Meeting of a new Session. They parted at the close of the last Session with the earnest hope that the vacation would be one of fruitful photographic work; and, looking at the beautiful display of pictures now on the table, he could not but congratulate them on the fact that those hopes had been fully realized. The glorious month of September had not been allowed by the Members to pass over without an effort to secure some noble results, and the exhibition of photographs now in the room was a convincing proof that those labours had not been unrewarded. He trusted they had now entered upon a Session of great usefulness, and that during its continuance the Members would never meet without having some paper read indicative of progress in their interesting art. It was with a full confidence of this kind that the Council met them, persuaded that, whatever difficulties presented themselves, as men of energy they would be able to overcome them, in like manner as photographers had often combated difficulties in the past, and achieved for themselves the most gratifying results.

The SECRETARY read the Minutes of the last Meeting, which were confirmed and signed.

The following gentlemen were elected Members of the Society:—

JAMES MUDD, Esq., St. Ann's Square, Manchester.

WALTER B. WOODBURY, Esq., Worcester Park, Surrey.

J. STEWART DISMORE, Esq., Windmill Street, Gravesend.

J. ADAMS, Esq., Dalehill Potteries, Burslem.

HERBERT J. ROBINSON, Esq., Church Street, Liverpool.

Major RUSSELL said, before proceeding with the business of the evening, he wished to reply to certain attacks which had been made upon him. After the treatment which he had received it was quite impossible that he could continue to take part in the operations of the Society, and he had merely attended on this occasion for the purpose of facing his accusers.

The CHAIRMAN intimated that the course now being taken by Major Russell was irregular, and said he should at once call upon the author of the first paper on the list to commence reading.

Major RUSSELL said it was quite immaterial to him whether or not the Chairman refused to hear him, as he intended to publish his reply. In the last Number of the Journal statements were made against him which he had come forward now to meet, but he did not care whether he were heard or not.

The CHAIRMAN said he was in the hands of the Meeting, and he must call upon the Members present to support him. He could only say that he had not the correspondence which had taken place with him, and he should not trust himself to state the bearing of it from memory; but if the whole of it was to be printed, he had not the slightest objection. In the fulfilment of his duty he had felt it necessary on a former occasion to allude to it, but he then mentioned no names and he brought no charge against Major Russell. He could not now allow the subject to be reopened, as in the absence of the correspondence he was not in a position to reply to any statements which might be made.

Major RUSSELL said it was true that he was not charged by name, but it was plainly indicated that he was the person referred to in the offensive attack that was made.

The CHAIRMAN appealed again to the Meeting to support him. He believed he had done perfectly right (loud applause) in the course he had taken; and if the correspondence were published, which he thought might be the better course, it would be found that he had not been wanting in due respect to the Society. It was well known before the last Meeting that he was going to mention this matter, and Major Russell had the opportunity of replying to it; but he (the Chairman) had had no notice that the subject would be revived this evening, and he was not prepared to hear any statement respecting it.

Major RUSSELL said it was known that the Chairman intended to mention the subject at the last Meeting; but it was not known that such language as had been used would be published in the Journal.

The CHAIRMAN said he had used no language in the Journal.

Major RUSSELL was not charging the Chairman with using it; but such language had been used that he felt bound to reply to it. He wished to know whether the Chairman still refused to hear him.

The CHAIRMAN said he certainly did refuse to hear him, not having received any notice. (Applause.)

Major RUSSELL said, that was quite sufficient for his purpose, and he had now only one remark to make, which was that, in consequence of this and other things that had taken place, he desired his name to be removed from the list of Members of the Society as soon as possible.

The CHAIRMAN said it was with deep regret he had heard the Major say that he had come to such a conclusion, because the correspondence which had passed was of the most gentlemanly and kindly character.

Major RUSSELL said he was not finding fault with the correspondence, but with the language of the Journal, for which he did not hold the Chairman responsible.

Mr. MAYALL said there was another course open to Major Russell besides that of retiring from the Society. Let him give fair notice, and then the matter of which he complained would come on in due order for consideration.

Major RUSSELL said it was not in consequence of this entirely that he now left the Society. When his reply was published his reasons would be known.

The CHAIRMAN said he could hear no more on the subject at the present time, but the business of the meeting must proceed.

Major RUSSELL handed the statement to which he had alluded to Mr. Taylor for publication, and left the room*.

Mr. DAWSON said he also wished to make a statement, which was a very short one. He was not present at the last Meeting, and did not know that anything was to be said.

The CHAIRMAN said that he wrote to Mr. Dawson, telling him most distinctly that he intended to bring the matter before the Council and the Meeting of the Society. If he had any statement to make, let Mr. Dawson follow the same course and make it in writing and in order; at the present moment he must certainly refuse to hear him.

Mr. DAWSON then left the room.

Mr. MAYALL read a paper "On the Construction of a Photographic Glass Room" (afterwhich a lengthened discussion took place), the report of which is necessarily deferred till the next Number of the Journal, it being needful to illustrate it with diagrams.

Mr. HUGHES read a paper on the preparation of the Iron Developer, the discussion of which, on account of the lateness of the hour, was postponed.

Mr. COOPER presented a paper which, for the same reason, was taken as read, and is published in the present Number of the Journal.

The cordial thanks of the Meeting were voted to these gentlemen for their valuable contributions.

Mr. ROSS exhibited a portfolio of photographs taken with his new Doublet lens of 6½-inch focus. They were remarkable for the width of angle included, accuracy of definition, and beauty of artistic effect.

Mr. DALLMEYER also exhibited a series of pictures taken with his new wide-angle lens, which excited the fullest admiration.

Mr. ENGLAND laid on the table an extensive addition to his well-known series of views in Switzerland and Alpine scenery, dedicated by permission to the Alpine Club.

Mr. STEPHEN THOMPSON and Mr. FRITH also exhibited some excellent views of the same localities. We hope to be enabled to more fully describe each of the series in a future Number.

Mr. Fox exhibited some pictures of especial interest—clouds, waves, &c., and also the same trees in foliage and in their denuded state.

Mr. R. S. ALLAN proved the value of the collodio-chloride process of Mr. SIMPSON in the portraits he exhibited, as did also Mr. Mayall and Mr. Robinson.

Mr. RUSSELL MANNERS GORDON produced a small selection of surprisingly beautiful landscapes, which seem to mark a new era in landscape-photography.

Mr. MAYALL's pictures taken by the solar camera adorned the walls of the room, and afforded much gratification to the Meeting. A life-sized portrait of John Bright, M.P., coloured in oil, and plain untouched photographs of the Poet Laureate and Mr. Mayall himself, surpassed any thing we have seen done by this method.

The CHAIRMAN, in closing the proceedings, said that at the next Meeting a paper would be read by Mr. Woodbury "On a new Method of Photo-Relievo Printing."

The Meeting was then adjourned till Tuesday, December 12.

On the preparation of the Iron Developer so as to produce dense negatives.

By JABEZ HUGHES.

THE use of protosulphate of iron as a developing-agent dates from early photographic times. At the Meeting of the British Association in 1844, Mr. Robert Hunt first pointed out its energetic properties for developing latent images on silvered surfaces. It is only more recently that its full services have been recognized.

It is a curious point in photographic history, that each process that has been in the ascendant has had its peculiar developer. With Daguerreotype it was the fumes of metallic mercury; with Calotype it was gallic acid; with iodized collodion it was acid pyro.; with bromized collodion it appears to be alkaline pyro.; and with bromo-iodised collodion it is protosulphate of iron.

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* Major Russell having given his statement to the Editor of the British Journal of Photography for publication, that gentleman passed it to the care of the Secretary of the Society.

In all negative processes it is not enough that a latent image be developed, but a certain amount of density must be produced to render it useful. In most processes this density is produced simultaneously with the development. It is not so with protosulphate of iron. I do not affirm that negatives *cannot* be produced dense enough for printing; I only state that, as a rule, with bromo-iodized collodion protosulphate of iron does not, *at once*, produce a dense negative. So general is this experience, that ever since the popular use of iron the photographic mind has been on the alert to discover means to remedy this undoubted want. At one time various substances were proposed to be added to the nitrate-of-silver solution. These were soon found guilty of the unpardonable sin of "putting the bath out of order," and were accordingly banished. Then the collodion was tampered with, and different materials were introduced into it. The constitution of collodion was found too delicate to admit of the presence of these foreign intruders, and it broke down, and the idea of getting intensity by that means was abandoned. Then came the long array of organic and inorganic additions to the developing-solution, as well as other methods to achieve the same end; so that, until Mr. Carey Lea a few months since wrote his glowing account of the good doings of a combination of gelatine with protosulphate of iron, we knew of no certain means of conquering the difficulty.

When nearly the right amount of intensity is supplied by the iron in the first instance, the plan of finishing, by giving a little increased density to the high lights by pyrogallic and silver, is a very satisfactory mode of working; but when the original deposit is thin, grey, and metallic, then are felt the shortcomings of the iron developer; for not only does the image require a great addition of strength, but it also takes the intensity unwillingly. Under these conditions the picture requires several applications of the pyro. and silver; the image has to be built up; and when the required density is produced, there is usually found a considerable loss of delicacy. The more forcing the image requires to become dense, the less satisfactory is the result. In a well-constructed portrait-studio, and with skilful manipulation, this defect exists in the least degree; but it is chiefly found in working in the open air (where the sky forms a large portion of the picture), or in using samples of collodion containing a large degree of bromide, in copying some kinds of pictures, in using a collodion giving only a thin and blue film, and in using old and weak nitrate baths.

In short, most persons must have found occasions when the iron developer was inadequate for its work, and, instead of bringing forth a vigorous image, only a shadowy one has been seen. Under such circumstances we feel that an injustice has been done to the primary image by the imperfect agent used to call it forth—as if, so to speak, a good and beautiful latent image was spoiled by the bad bringing out.

I look upon *development* as the most remarkable portion of photography; and in practice, next to the management of light, I think it the most important part of manipulation. It is true, daily practice makes it familiar, but in this case, at least, familiarity should but increase the wonder. While this aspect of the subject is present to our minds let us dwell on it; and, as we take the exposed plate from the dark slide, before pouring on the developer, let us ask ourselves what we are going to do. We are about to witness one of the most wonderful things in this wonderful world! A few minutes since, a ray of light, associated with countless other rays of light, was deep in the sun's photosphere. With its own directness it darts forth, its destination this earth; onwards and onwards it comes at a speed that our finite faculties, though measuring, can never appreciate. As it approaches our globe it is bent out of its course, here a little and there a little; but onwards it passes till it reaches the smiling face of a happy child, fresh as itself from creation. But its mission is not ended; it but stops to kiss the features it illumines, and, at an angle, onward again it goes through walls of crystal into its mystic chamber. There it stops, and in its own invisible manner depicts the thing of beauty it travelled a hundred millions of miles to register.

The marvel is but half complete. *Has* the subtle ray left its impress behind? Is not this plate, in which no difference can be detected, in the same condition as before exposure in the camera? Can there have been agencies at work so potent as to quite change the nature of the film, and yet so silent and invisible as to leave no apparent evidence behind?

Who will dare say that depicted on that blank surface is an invisible picture of marvellous beauty, or that concealed in that vacant space is a likeness of God's own image? Yet, mark the change! On the filmy surface pour that unthinking, unconscious fluid, and what was but now a vacant blank becomes an unfolded picture of truth and beauty, such as Nature only can paint, and man only can admire! Am I not right, then, in saying that the development of a latent image is one of the most wondrous things in this wondrous world?

To return to the more prosaic aspect of development, any one who aids us in understanding its mysterious nature or in improving its practice should be warmly greeted; and I think such greeting is due to Mr. Carey Lea, not only for his clever investigations into the nature of the photographic image, but also for the valuable results that have flowed from his introducing gelatine into the iron developer. I am not aware if this gentleman's name has appeared before in the transactions of this Society; but in acknowledging him as the introducer of the gelatino-iron developer I should like to be allowed to express to him, both as a representative of American Photography and personally, the great gratification that a very large section—I think I should not be wrong if I said the entire community—of English photographers experience in reading his numerous and valuable contributions. We scarcely know which most to admire—his sound practical and theoretical knowledge, his intimate acquaintance with what is going on in all countries (which makes him a cosmopolitan as well as an American photographer), or the amiable and courteous manner in which he invariably expresses himself. I do not know that I compliment American photographers generally, and him in particular, when I say that I think that the mantle that fell from our own Hardwich seems to have descended on to the shoulders of Mr. Carey Lea; for I know no gentleman who, in his various communications, so much reminds me of him whose presence we prized so highly, and whom we were so sorry to lose. Be it Mr. Lea's good fortune long to hold the post of "guide, philosopher, and friend;" and, in that land of fertile intellect, may many more arise to emulate him in advancing our common Art-Science.

Next to nitrate of silver, I know of no substance that has engaged so much photographic attention as gelatine. In the beginning it was pressed into the service of photography; and, more or less, through thick and thin, it and photography have stuck together to the present hour. Among its many proposed uses I am not aware that any have suggested its addition to the iron developer till Mr. Carey Lea. It is hazardous, though, to speak of any one as a discoverer or inventor in photography; for the field is so fertile, and the active minds so numerous, that scarce anything is attributed to one, but another is found to have been before him; so that there seems singular point in the old aphorism that "there is nothing new under the sun," in the very science of the sun. Till it be controverted, however, let the assertion remain that this improvement is due to Carey Lea.

Gelatine added to the iron developer seems to act beneficially both mechanically and chemically. By the increased glutinous properties it gives to the solution, this seems to flow more steadily and certainly over the collodion-surface, so that, not hesitating or running into irregular lines, it does not cause the stains and markings that it otherwise is prone to. By this means the developer may be poured on more deliberately, and less solution will be required for the plate; the quantity of nitrate of silver thus becomes less diluted; and from this cause it tends to produce a more dense picture. The gelatine acts chemically by restraining the iron from acting with its usual violence; so that the silver, instead of being very quickly deposited, is done so more slowly, and in the ratio of the action of light itself. It also causes the deposited silver, instead of being thin and grey and transparent, to be dense and brown and more opaque. Moreover it has a great tendency to prevent the silver depositing where the light has not acted, thereby keeping all the deepest and faintest shadows very pure, thus relatively increasing the density of the negative.

While I acknowledge that Mr. Lea has done good service in relation to improving the iron developer, I wish also to state my conviction that since his communication other and more simple means have been suggested for achieving the end.

Two methods in particular have been proposed—the one by Mr. Cherrill, in the 'Photographic News,' and the other by a correspondent of the 'British Journal of Photography,' who signs "Clericus"—which are sufficiently effective, and very easy.

Mr. H. Cooper has also been early in the field with his method—a variation of Mr. Cherrill's—and also with his contribution of knowledge flowing therefrom: and to what real or imputed improvement in photography does not Mr. Cooper contribute?

Mr. Cherrill's method is well adapted where considerable intensity is required, as there is no difficulty in obtaining any amount whatever. Mix one ounce, by measure, of ordinary sulphuric acid with one ounce of water; let them cool. Then add 120 grains of gelatine; when dissolved, add a few ounces of water, say five, and neutralize with ordinary ammonia. Add an ounce of glacial acetic acid, and make up the total quantity to 20 ounces of solution. To form a developer, prepare a 20-grain solution of protosulphate of iron, and add to each ounce from 10 minims to 1 or even 2 drachms of the above sulphuro-gelatine mixture, according to the intensity desired, remembering that the intensity will be just in proportion to the quantity of the mixture added. This, and kindred solutions, I propose to call the "Sulphuro-gelatine" developer.

The next developer is the one I most recommend. It is but a variation of that of "Clericus," and I propose to call it the "Aceto-gelatine" developer:—

Glacial acetic acid	2 ounces.
Distilled water.............	8 „
Nelson's gelatine	120 grains.

Mix, dissolve, and filter.

Then add to it—

Distilled water.............	70 ounces
Protosulphate of iron	2 „

This developing-solution keeps well. In cold weather it is apt to gelatinize, but a little warmth sets it all right. This solution flows like oil on the plate, readily mixing with the free nitrate, and has little tendency to form stains and streaks. The image comes out slowly and steadily, and not with a flash. The high lights, if the exposure is rightly timed, will be found to have nearly or quite the right density by the time the detail is out. If not sufficiently dense when fully developed, the solution may be poured on and off and the density will increase, or a little fresh solution may be taken, to which a few drops of silver have been added; and any amount of intensity may be obtained. The images dry intense, and are not much reduced in varnishing.

These solutions admit of considerable variation; but, whichever be used, I urge on all to take care and not make their negatives too intense: there is such a tendency in that direction, and this form of developer gives great facility.

In a communication I addressed to the 'British Journal' on this subject, I expressed a wish for some form of a salt that by simple dissolution, like the protosulphate, would give the desirable intensity. I am pleased to say my wish has been responded to. Mr. Ramsden of Leeds has sent me a preparation that seems well calculated to that end. It does not give equal density to the gelatine developer; but it very nearly approaches it. It is certainly an improvement on the usual plain protosulphate, and many persons who desire a moderate increase of density may find in this salt all they desire.

I cannot conclude without recording a few trials I have made of Mr. Wharton Simpson's honey developer. To an ordinary 15-grain protosulphate solution, with 15 minims each of acetic acid and alcohol, I added one drachm (by weight) of honey. The honey was obtained from the nearest druggist. I was very favourably impressed with the density, softness, and general good quality of the image produced, and I recommend gentlemen experimentally inclined to test this against the gelatine, as, though differing in character of image, they each agree in communicating increased density to the negative, and it is possible the honey may be found quite as efficient as the gelatine, and by some may be preferred.

If I were asked the way to obtain the fullest advantage of these gelatine developers, I would say, Prepare three bottles of solution, A, B, C. Into A put a 15-grain solution of protosulphate of iron, and 15 minims per oz. each of glacial acetic acid and alcohol; into B put the aceto-gelatine developer; and into C put a 15-grain solution of protosulphate of iron, to each ounce of which add 2 or 3 drachms of the sulphuro-gelatine mixture. Contained in these three bottles would be three strengths capable, separately or mixed, of forming every desirable variety of developing-solution, from the density of the strongest pyro. to the weakness of common iron; and further, suppose B, containing the aceto-gelatine developer, be considered the usual one, then, as the weather or the subject changes, by adding to it a little of A or C, the intensity of the developer is quite under control, and can be weakened or strengthened as desired.

After more than three months' work, in considerable variety of weather and with many different subjects, in and out of the studio, I record it as my deliberate conviction that, used with judgment, the addition of gelatine to the iron developer is one of the most valuable discoveries recently made in practical Photography.

Improved Formula for Solution to make the Organico-Iron Developer. By H. COOPER, Jun.

AFTER many experiments, I have arranged a formula that is superior in some respects to the one given by me at the North London Photographic Meeting, on Oct. 4th, 1865, and which was published in the last Journal. I do not give this new formula with the idea that it is the best that can be found, but simply as one that can be depended upon, and that is an improvement on those hitherto given.

I have spent, and hope still to spend, a good deal of time in investigating the action of different combinations of gelatine in the developer, and also when applied to other purposes. I have already obtained a number of curious and interesting results, some of which I am sanguine of turning to practical account. I hope shortly to place a record of some of the most important experiments at the disposal of those interested in the improvement of our photographic formulæ. A few of the advantages of the mode I am about to give can be very briefly enumerated. To begin with, it is easier to prepare; and it appears to me to offer less chance of failure in its production. In the second place, it is more economical than the old formula, there is much less acetic acid used, and this latter is the most expensive ingredient employed. Another recommendation is that the gelatine solution itself can be easily filtered, as also the finished developer; whereas, in my first method, the solution I called *number two*, gelatine dissolved in diluted acetic acid, is much too viscid to run through paper, and the developer to which the compound solution has been added is also sometimes difficult to get easily filtered.

I will now describe the mode which, up to the present time, I have found most generally successful for producing the new solution for the organic developer. I must, however, premise that I am indebted to several gentlemen, as well as to works on chemistry, &c., for some suggestions that I have made use of in this formula and in my other organic preparations for the same purpose. Concerning the latter, "more hereafter." To proceed:—Soak 3 drms. of good strong gelatine in cold water until swollen and quite soft. Drain off the surplus water, and place the gelatine in a stout earthenware or stone jar. Pour in 1 oz. of commercial concentrated sulphuric acid, and well stir with a glass rod. Pure acid may be used; but I have found no advantage from doing so, and it is more expensive than the ordinary. The gelatine is immediately dissolved; still I would advise that the solution be allowed to stand for an hour or two before neutralizing.

In my next paper I shall enter upon the question of the propriety of thus preparing the solution which, for want of a better title, I suppose we must call the "sulpho-gelatine." I do not deem it necessary to do so here, as it might only confuse and divert the attention from the plain directions I am endeavouring to give.

After the sulpho-gelatine solution has remained undisturbed for the allotted time, dilute with 4 ozs. of water, and then add sufficient liquor ammoniæ, little by little (stirring meanwhile), to render the solution very faintly alkaline. The solution will be found to be very hot, and should be left till cold—the heat being produced by the union of the sulphuric acid and ammonia. Some photographers may find a difficulty in procuring strong liquor ammoniæ, sp. gr. 880; so, if they have only the weaker or ordinary ammonia of the shops, of which I believe the specific gravity is about 980, they need not trouble about the stronger kind, but use the weak, omitting, in this case, the 4 ozs. of water which I have directed to be added to the gelatine solution. To avoid all chance of spirting, it may be as well to add 1 oz. of water before the ammonia.

About 2 fluid ozs. of the 880, or 6 ozs. of the weaker, will be required to effect neutralization. When the solution is cold, add ½ oz. glacial acetic acid, filter, and make up with water to 16 ozs.

Sometimes a slight milkiness has been apparent after filtration, but it disappeared upon the addition of the extra water; at other times the solution has been quite clear before the dilution; and it is worthy of remark that generally, when the milkiness has occurred, the finished liquid has been as colourless as water, but that when it has run bright from the filter it has retained a slightly golden tint. The absence or presence of colour does not appear to alter its working-properties. To make the developer, dissolve from 25 to 40 grs. of protosulphate of iron in an ounce of water, and add from 30 minims to 2 drms. of the solution made as just described. No alcohol is required. I fancy I hear some exclaim, "Why, this is no formula at all for a developer, and it would have been just as well not to have given it." The reason for giving it is to show that the developer consists simply of sulphate of iron, the organic solution, and water. The strength is put down thus vaguely, because it must be altered for each person's working. Approximate proportions only can ever be given for the developer, as they necessarily vary with the condition of the bath, collodion, light, lens, and subject, not to forget the all-important one of temperature.

The manufacture of the gelatine solution is not nearly so awful an affair as it looks on paper—the directions themselves being somewhat lengthy, as they have been made as explicit as possible, so that there may be no chance of failure through misconception of them, even in the hands of those unaccustomed to manipulations of the kind. It may be well to mention that, should the sulpho-gelatine solution, *before* neutralization, by any accident get spirted on the hands or face, the part should be immediately washed with cold water and a little very dilute ammonia. Should it be the clothes that are spotted with it, strong ammonia must be applied, and then sponged off with warm water; but by using ordinary care, no accident need happen. Those who do not like the trouble of making the solution themselves can procure it ready prepared of Messrs. Francis. It has been made very many times in accordance with the formula given, both in large and small quantities, and has never once resulted in failure. I consider it only fair to the photographic public that a formula should be tested many times before giving it as one to be depended on, and not to do as has been done—make a single experiment, and, because it happened to be successful, fancy that it must always be so, and present the recipe to the world as reliable. On the other hand, it is equally unjust to condemn a formula on the adverse result of a solitary trial. In concluding, I must express the wish that all may be as successful as I have been with the modification described; and I would earnestly recommend those who may be so unfortunate as to fail the first time, to try again, after carefully re-reading the directions. Should success not then attend their efforts, it will give me great pleasure to place any little experience I may possess in the matter at their service.

Nov. 4th, 1865.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

This Association held its usual Monthly Meeting at Myddelton Hall, Islington, on Wednesday, November 1st. W. W. King, Esq., in the Chair.

Mr. Barnett (Hon. Sec.) read the Minutes of the last Meeting, which were confirmed.

Mr. Smith (of Negretti and Zambra's, Fleet Street) was elected a Member of the Association.

Mr. J. T. Taylor exhibited some examples of Mr. Woodbury's Photo-relief Printing Process, and called attention to the progress which Mr. Woodbury was making. He stated that, having been supplied by Mr. Woodbury with examples of the process, prints, and plates, for the purpose of forwarding to Edinburgh, it occurred to him that they might be interesting here. A desultory conversation thereon followed, in the course of which

Mr. G. Wharton Simpson explained the details of the method of printing employed, and exhibited a very charming example on opal glass so produced, remarking that, when a paper equally fine and even in texture with the glass could be obtained, there would be no difficulty in securing prints on it equalling that shown on glass.

Mr. Taylor showed some of the plates, and also showed a piece of soft white metal with the perfect impression of a feather, to illustrate how perfectly delicate images might be produced in metal by means of pressure. The principle somewhat resembled "nature-printing."

The Chairman said it was a most important step in advance that such a process, promising such results, should be discovered, in which not only rapidity of production, but permanency would be secured, and the great want of photographic book-illustration secured. It was frequently the case in the history of photography, that after resting for a time, apparently without progress, a sudden advance would be made, as in the present instance.

A short conversation on the new organico-iron developer followed, and Mr. H. Cooper, Jun., stated that he was making very extended experiments, and had already arrived at improved and very satisfactory results, the formula for which would appear in the Society's Journal for the present month (see p. 186).

Mr. Hill asked if anyone knew anything of Mr. Breese's method of working in producing his very exquisite transparencies, and by what process their superiority was produced.

Mr. H. P. Robinson said he believed that it was chiefly due to the brains employed in producing them. Mr. Breese brought good taste and extreme care to bear upon his work.

Mr. Simpson said that if Mr. Breese were to publish every detail of his operations it would probably be found that there was little secret in the matter beyond his own taste and skill. Photography abounded with illustrations of the fact that one man would produce with the same materials, formulæ, apparatus, &c.—in short, all the same material appliances—most exquisite pictures, whilst another would produce the merest smudges, without any excellent quality whatever. Professional portraiture abounded with such instances.

The Chairman asked Mr. Ackland to give the Meeting some details of his recent modifications of the Fothergill process. Anything which would save them from the troubles of the tannin process and its frequent concomitant, which had been styled "blurring," would confer a great boon to photographers, especially to amateurs.

Mr. Ackland said that, as to the process, he had not much to add to what had already been published. He might state that he literally had no failures. There was no tendency to blurring, or to any of those disadvantages by which the tannin process seemed beset.

The Chairman asked if he had met with those troublesome spots so common to tannin plates.

Mr. Ackland said he had met with some spots, but in one instance only, and that arose from a deposit in the acid silver solution, and was removed at once by filtering that solution before it was dropped into the developer.

The Chairman asked if Mr. Ackland found this process more certain than the tannin, in which so much depended on the special quality of the collodion. With the tannin he had been much troubled. He tried collodion from three different makers: in each case the first time the results were satisfactory, but in each case the next sample gave him "blurring." This uncertainty was most perplexing, and seemed to be unavoidable with even the utmost care.

Mr. **Ackland** had tried with his recently published modification of the Fothergill process four samples of collodion, all purposely differing widely, and in each instance with satisfactory results in all respects.

The **Chairman** remarked that one of the advantages claimed for the collodio-albumen process was that it was independent of the character of the collodion.

Mr. **Ackland** said that this was the case because the picture was really formed on the albumen. In the Fothergill process the picture was produced on the collodion, which seemed, however, to be so modified by the solution of albumen, that different qualities of collodion seemed to make little difference in the finished negative.

The **Chairman** said that a perfect dry process would be a great boon to amateurs; and the simplicity and certainty of this seemed to promise great advantages. He had given the tannin process an extended trial, and had in many respects liked it; but its uncertainty was most troublesome, and his last excursion with tannin plates had upset his faith in them, the result being most disheartening.

The **Chairman** proposed that an address of congratulation on his release from the hands of the brigands, should be forwarded to Mr. Moens, from the Society,—which was carried by acclamation.

After some other votes of thanks, the Meeting was adjourned to December the 6th, when the subject of the new organic developer would be introduced again by Mr. Cooper.

On Stereoscopic Phenakistoscopy.

To the Editor of the Photographic Journal.

107 Regent Street, 31st October, 1865.

Sir,—I have read in your last issue the interesting letter of Dr. H. G. Wright, stating that a friend of his, Mr. H. Mayhew, had obtained, in 1859, a photographic phenakistoscope, which he says worked admirably. Dr. Wright's letter is followed by one of Mr. Mayhew himself, full of curious suggestions, but not giving a very clear description of the contrivance by which he had obtained the stereoscopic and the phenakistoscopic effects by means of photography.

In my paper alluded to by Dr. Wright, I spoke exclusively of M. Duboscq's invention because it was the only one which, to my knowledge, had been published on the same subject. But I stated that from the beginning of the application of photography to the stereoscope, a great number of persons must necessarily have been struck with the idea that photographic pictures might be most advantageously employed in attempting to combine the stereoscope and the phenakistoscope; and it would appear that Mr. Mayhew was one of those whose attention had been turned to the subject.

M. Duboscq's apparatus was constructed and published in the last part of the year 1852, and my own was completed about the same time. These two facts are related in a letter of M. Duboscq, dated Paris, the 8th of November, 1852, in which, after having informed me he had just forwarded his new apparatus, he requested me to send him mine, in order that he might be able to compare it with his own.

It is evident that Mr. Mayhew's attention was not directed to this subject till seven years after M. Duboscq's and my attempts had been published. However, as it is never too late to bring to light inventions made towards the solution of an interesting problem, I should be very glad, and I am sure all the photographic and scientific world would feel the same, if Mr. Mayhew were kind enough to bring his apparatus at the next meeting of the Photographic Society and show by what means he has been able to produce the stereoscopic effect with phenakistoscopic pictures obtained by photography. At present I cannot conceive how he has been able to change the pictures, or to substitute one pair for another pair of the stereoscopic pictures, without confusion and without their appearing to turn on themselves. For it is absolutely necessary that one picture should, as it were, dissolve instantaneously into the next without the substitution or change being in the slightest way noticed by the observer, or else the effect would be spoiled and the whole illusion destroyed.

It is very curious that, so long as seven years after me, Mr. Mayhew should have made his experiments precisely with the same identical subjects I had devised for mine,—viz. my own picture (as was the case with Mr. Mayhew's) in the act of bowing, taking off hat, and bending the body, and that of a young lady kissing her hand to the spectator. I am sure Mr. Mayhew did not copy my idea; and if I relate the fact, it is merely to give another instance of strange coincidences so frequent in the general run of inventions.

There is a part of Mr. Mayhew's letter which I consider exceedingly interesting. I allude to his idea of trying whether it would not be possible by means of the phenakistoscope to realize all the effects of *apparent* motion of a landscape, as when we are travelling in a railway-carriage—in fact, to give us the illusion that we are rapidly carried along the country as when travelling on a railroad.

This idea seems to me entirely original; at all events it is quite new to me. It is very curious, and I consider the attempt to produce such an extraordinary result well deserving the attention of scientific minds. I quite agree with Mr. Mayhew that the illusion of our own motion before stationary objects is as curious as the conditions determining the illusion of solidity. I think that the defect Mr. Mayhew mentioned, of the mountains in the extreme distance travelling at the same speed as the trees in the immediate foreground, is only the result of his not having attended to some of the requisite conditions, and that this defect may be easily overcome. I do not hesitate to assure Mr. Mayhew that if the photographs have been properly taken, and if the phenakistoscopic-stereoscope is well managed, the effect must be perfectly correct, and exactly similar to that which in reality makes the landscape appear to revolve on a fixed point of the horizon, and pass before us, from that most distant point, in velocities gradually increasing as the distance diminishes, and according to the laws of perspective. The principal difficulty in producing an effect of a sufficient duration would be the great number of consecutive pictures required, in order that the space run over during a great velocity between two pictures might not be so large as to present no connexion between them.

I hope Mr. Mayhew's idea on that subject will not be abandoned by him, and at the same time will be taken up by others, in order that what can be done to produce this new and curious illusion may be fairly tried.

I am confident that the Photographic Society would be very glad to be able to bring the entire subject of stereoscopic phenakistoscopy before the members at their next meeting; and I hope that Mr. Mayhew and Dr. Wright will both kindly lend themselves to entertain the meeting on such an interesting question, and enable the members to see Mr. Mayhew's apparatus.

I am, Sir,
Yours very truly,
A. Claudet.

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The History of Alkaline Development.

[Some few months ago, as our readers will remember, a controversy took place in these pages arising out of the circumstance that in a leader on the subject of the tannin process we made incidental allusion to the names of gentlemen whose original discoveries had been developed, and made of practical value in working out his experiments, by Major Russell. That gentleman contrived to discover something offensive in those allusions, and seemed disposed to ignore the value or suggestiveness of the published discoveries of others in a path in which he himself subsequently trod. We then briefly substantiated the statements we had made, and we thought the matter was at an end. In a recent Number, however, of the 'British Journal of Photography,' we find a somewhat lengthy article, purporting to relate the history of alkaline development, written apparently chiefly to glorify Major Russell at the expense of not less worthy, though possibly more modest, gentlemen, and attacking some of the statements made some months ago. Unpleasant and distasteful as would have been the task, it would have been our duty to rebut some of the statements made, and point out the false inferences drawn. In the 'Photographic News,' however, we find an article which saves us from the necessity of restating the case—the article in question so completely covering the ground, that it leaves nothing further to be said on the subject. We the more readily avail ourselves of the opportunity of transferring this article to our pages, because some of the more important facts in connexion with the history of alkaline development were first published in the pages of that Journal, and we should, even if we had ourselves written a brief history of the matter, have had frequently to refer to its pages for the original announcements on which that history is based.]

A tardy combatant presenting himself on the field long after the struggle was over and nearly forgotten, accounted for his delayed appearance by saying that he "had been falling back for a spring." An article in a contemporary, purporting to be "some" facts in the history of alkaline development, comes like the tardy combatant into a discussion on that subject, which originated nearly six months ago in the 'Journal of the Photographic Society,' and was, we had believed, long since closed and nearly forgotten. Whilst our intervention was unnecessary, we took no part in the controversy. As, however, the article in question only states "some" facts and ignores others, and as a statement of the whole is necessary to the elucidation of truth, it becomes incumbent upon us—many of the facts to which we refer having been only recorded or first published in our own columns—to complete the history, as partial truth is often suggestive of whole untruth.

We shall be as brief as possible—stating facts, and avoiding unnecessary discussion. An atmosphere of strife, even in the cause of truth, is not a wholesome one, although it becomes at times inevitable to every honest man. It is not pleasant to be under the constant necessity of reexamining those facts which had been duly investigated, labelled, and put away in the mind's storehouse as satisfactorily decided; but it becomes imperative if these facts have any interest and are boldly impugned.

Almost every great improvement in photography has been the result of the combined labours of many experimentalists. One discovers a new fact; another ascertains the laws upon which it depends; a third makes new applications or developments of it; and the matter progresses into a definite system of general application. Alkaline development for dry plates is no exception to this rule, and we proceed to give the summary of facts which mark its history, or led to its discovery, adopting, for the more easy correction of error, the same method of stating the case which is employed in the article in question.

In the 'American Journal of Photography,' July 15th, 1862 (see also 'Photographic News,' Aug. 8th, 1862), Mr. Borda published an article entitled a "New Rapid Dry Process," in which he stated that, acting on a suggestion from Mr. H. J. Anthony, he had tried the fumes of ammonia as an accelerator in dry-plate photography. Mr. Anthony, he states, had, *some years previously*, submitted a dry plate to the fumes of ammonia, and secured a good negative with very short exposure. Mr. Borda, after first trying tannin plates, applied this fuming to various kinds of dry plates; and it may be of interest here to quote his own remarks on the comparative results obtained.

> My experiments with fuming did not stop with the tannin plate. I thought it too valuable not to apply it to other processes, and it naturally occurred to me to try some dry process quicker than the tannin. I tried the resin process, and first on its own merits. I succeeded with it beyond all my expectations; and by a ramble in our mountains, in which I filled every one of my double dry-plate holders with a tannin plate and a resin plate, duplicating each view, I ascertained beyond a doubt that the resin plate was at least twice as quick as the tannin plate. The collodion was the same. The resin plate, with half the exposure, gave more softness, and more details in the shadows. The fuming by ammonia accelerated the resin plate fully in proportion, and six to eight seconds gave me a good negative, where fully fifteen were required with the tannin. With a quarter tube and no diaphragm, I obtained, with the resin plate, in one second a negative full of details in the shadows.

Mr. Borda first tried the fuming before exposure, but subsequently found that it was as efficient and more convenient applied after exposure and before development; and in doing this he first ascertained—without, however, perceiving its significancy—*that the image could be developed with the fumes of ammonia.* We again give his own words. He says, "I soon ascertained also that it was not necessary to fume the plate before exposure, but merely before development. * * * While making the above experiments, it happened several times that a tannin plate, from which the free nitrate could not have been washed off thoroughly, gave me *a faint image of the high lights* when soaked in warm water, *after fuming with ammonia, and before any developer was used.*"

Nearly three months later Mr. Glover, an able photographer, now, alas! dead, published in the 'British Journal' of October 1st, 1862, an article entitled "On Dry Development of Dry Plates," in which he detailed his experience with Mr. Borda's method, verifying and further developing the same fact, a fully detailed image being obtained by fuming. Employing plates prepared with tannin and honey, he fumed them after exposure. We give the result in his own words:—

> On taking out to examine, I was most agreeably surprised to find a fully developed image, displaying all the details, down to the very shadows, as distinct as the negative which had had the full exposure—but of course lacking the necessary intensity, which, in amount, I could only compare to the appearance of a glass positive when viewed by transmitted light. The plate was again subjected to the action of the gas, but with no marked increase of vigour.
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> I proceeded next to develope in my usual way, by soaking about two minutes in water, then covering with a solution of pyrogallic acid, without either acid or silver. Under this action I could not discover any addition to the intensity. On adding the silver with an additional quantity of citric acid, my hopes were doomed to disappointment, as a cloudy deposit commenced, which completely veiled every trace of an image, with the exception of the highest lights.

Some further experiments are detailed, the final result of which he described as encouraging, "although not so clean and free from defects as the plate exposed and developed by the usual method." He further expresses an opinion that the presence of free nitrate of silver and of honey played some part in producing the result. The editor, Mr. Shadbolt, commenting on the communication, says:—

> The experiments above detailed are very interesting; but we are not so surprised at the results, because honey being a reducing agent, acts energetically upon nitrate of silver in the absence of

free acid; hence the appearance of an image after the ammonia had acted upon the impressed plate. As, however, all the free nitrate of silver would have been reduced on the first application of ammonia, it is clear that no further application of it or of pyrogallic acid could intensify the image, there being no nitrate of silver left wherewith to perform the operation.

In the same month, October 23rd, Mr. T. M. Leahy, of Dublin, sent us a communication, which appeared in the 'Photographic News' of November 7th, 1862. This letter contained not only the first announcement of the fact that the image on a tannin plate could be developed with a solution of ammonia, but that free nitrate of silver played no part in the development, and was unnecessary. Mr. Leahy had been experimenting with the American discovery of fuming, and he, like Mr. Glover, had remarked the fact which Mr. Borda first announced, that when the plate was moistened after it had been submitted to the ammonia-vapour, an image appeared. He went further, therefore, and tried the ammonia in a liquid form with complete success. We give the statement in his own words:—

> In some experiments in the tannin and honey process, in which I tried fuming with ammonia as an accelerator, I remarked that, when the plate was washed after the fuming, the image came out very distinctly; it struck me that the ammoniacal vapour might have become, in some measure, fixed on the plate, and that, on the application of the washing-water, it dissolved and acted as a developer. Following up this idea, I gave a plate a very short exposure in the camera, and *immersed* it in a very weak solution of ammonia: almost immediately the picture began to appear, and continued to come out until nearly all the details were visible. I then washed it well and applied the pyrogallic acid and silver, which rapidly completed the development of the picture, without the least sign of fogging or stain of any kind.
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> This development of the latent image could not have resulted from any free nitrate being left in the film, as I not only wash it thoroughly after sensitizing, but also pour a 3-grain solution of chloride of sodium two or three times over it, when I again wash and pour on the tannin and honey solution. The use of the ammonia in the liquid form, I think, has one great advantage over the fuming: it acts equally; and the picture being washed before applying the pyrogallic acid and silver, no deposit (such as sometimes occurs when the *fuming* is carried to any extent) can take place.

This discovery, it will be observed, is not one of those in which a suggestive but hopeful result is obtained; but the discovery is complete, and the success perfect.

On the 15th of November, 1862, three weeks after we had received Mr. Leahy's letter, but only eight days after it was published, Major Russell published in the 'British Journal' a communication "On Development with Ammonia," in which he describes his experiments with the American fuming system, which induced him to add ammonia to pyrogallic acid, and with it develope a plate. He recommends, as producing the best result, "one drop of the strongest solution (of ammonia) sold in four ounces of water," with "a few drops of alcoholic solution of pyrogallic acid," and adds that, if certain precautions are adopted, the "method appears to be easy and certain." He was less successful with ammonia, and adds:—"Ammonia will develope a picture by its action on tannin, if the exposure has been long enough, but it must be much longer than is required when pyrogallic acid is used the same way."

On the 16th of December, 1862, Mr. Leahy sent us another communication, in which he stated that he had ascertained that carbonate of soda answered almost as well as ammonia for developing tannin plates; and on the 4th of March, 1863, he wrote to say that he had found that lime-water would develope tannin plates. The announcement of these facts will be found in pages 2 and 130 of our seventh volume.

During the time which has elapsed since then, many workers have contributed their quota to the progress of alkaline development, amongst whom the names of England, Hughes, Sayce, Wardley, and others occur to our memory. To Major Russell, however, is chiefly due the energetic and skilful working out of this mode of development, and also of the methods of working by which it is best available for good and rapid results. In May 1865 this gentleman described at the Photographic Society an important advance made in the use of alkaline development. In all the methods before used, a phantom image without vigour was produced by the alkaline development, which required intensifying in the usual way with silver and pyrogallic acid to give it printing-qualities. In the improvement to which we refer all this is dispensed with. A film containing a thick body of bromide of silver is used, and sufficient intensity for printing is obtained by alkaline development without the use of any free nitrate whatever, the image being obtained by the reduction of the bromide of silver contained in the film.

This is, we believe, a succinct account of the origin and progress of alkaline development, in which no fact of importance is omitted, in which nothing is included which does not form a distinct link in the chain of evidence, and in which nothing is stated which is not capable of the easiest substantiation by reference to published documents. We may summarize the facts as follows, attaching to each the earliest date connected with it in the published records:—

July 15th, 1862, Mr. Borda published in America his method of fuming dry plates with ammonia, and obtained on tannin plates an imperfect image before applying developing-solutions.

October 1st, 1862, Mr. Glover published his experiments in the same direction, and stated that by fuming an exposed tannin and honey plate he also obtained an image before applying developing-solutions, with the advantage that it was fully detailed, but lacking intensity, which it was found difficult to secure satisfactorily, on account of a tendency to fog.

October 23rd, 1862 (published November 7th, 1862), Mr. Leahy announced his experiments with Mr. Borda's method, using tannin and honey, with which fuming gave him a distinct image—but also announced that he had discovered that perfect development was secured by the use of a solution of ammonia, and that by the aid of the usual solutions the plate rapidly intensified without stain or fog.

November 15th, 1862, Major Russell published his experiments with ammonia, announcing his discovery of its developing-action, and recommending for tannin plates a solution containing ammonia and pyrogallic acid.

December 16th, 1862 (published on the 2nd of the following month), Mr. Leahy announced that carbonate of soda answered for development almost as well as ammonia; and on the 4th of March, 1863 (published on the 13th of the same month), the same gentleman announced that lime-water would serve the same purpose. The significancy of these two announcements consists in the illustration they afford of the fact that it is the action of the alkali which is concerned in the operation, rather than of any property peculiar only to ammonia.

May 11th, 1865, Major Russell announced his discovery (apparently made some time before) that perfect negatives with printing-intensity could be obtained with tannin and bromide-of-silver plates, by the use of the alkaline developer without any free nitrate whatever.

Having thus epitomized, we shall offer but one or two remarks on the statements which have rendered our notice of the matter necessary. The writer of the article to which we at the outset referred divides the history of alkaline development into four stages,—the first, in which he states Mr. Anthony discovered the *accelerating* effects of ammonia on tannin plates; the second, in which he states that Mr. Glover discovered the *developing*-action of the fumes of ammonia on tannin plates; the third, in which he states that Major Russell discovered that liquid ammonia, in conjunction with pyrogallic acid, was an energetic developer of tannin plates; and the fourth, in which he states that Mr. Sutton discovered that carbonate of soda might be substituted for ammonia, the date he ascribes this discovery being September 1863. The article concludes by saying, "We are open to correction on any points advanced above which may be inconsistent with other published evidence which we have not seen. We should esteem it a favour if any error were pointed out, our only object being to render honour to whom honour is due." This seems fair and candid, and we supply the required corrections; we regret, however, that the desire expressed is scarcely borne out by previous remarks in the article, which show that the omission of the name of Mr. Leahy in these assumed stages is not the result of ignorance of his claims. His discovery of a method of securing perfect results with liquid ammonia, *used for the first time*, is described as no improvement on Mr. Glover's results, acknowledged as unsatisfactory, with the fumes of ammonia; and notwithstanding that it is stated that Mr. Leahy was not a reader of the Journal in which Mr. Glover's announcement appeared, and, as the writer states "he has reason to believe," was not aware of Mr. Glover's experiments, the communication in which the discovery of the action of liquid ammonia is announced is stigmatized as "only an echo of Mr. Glover's paper," which he had not seen! Having thus disposed of the matter by assertion in the direct face of proof, "Mr. Leahy and his friends" are alleged to be "thus put out of court, and their alleged claims shown to be groundless"! This mode of a *showing* a claim to be groundless consists in abstaining from quoting a word of the letter containing it, and alleging that it is something which it is not. Mr. Leahy's discovery of a method of securing perfect results with a liquid, instead of imperfect results with a vapour, is a "modification which is no improvement," whilst Major Russell's discovery of the same or a similar fact some time later is styled a distinct stage in the history of the process. Facts in the hands of some writers seem as plastic as clay in the hands of the potter; but the fabric they form is also as easily shattered into atoms.

Just as completely ignored is the fact that Mr. Leahy first announced that carbonate of soda might be substituted for ammonia—the discovery being attributed to Mr. Sutton at a period nine months later than Mr. Leahy's publication, although, so far as we are aware, Mr. Sutton never claimed the discovery for

himself, although he did systematize a method in which it is employed. The error in regard to carbonate of soda we are willing to believe is the result of imperfect knowledge, upon which we do not intend to comment.

In conclusion, we ask those concerned to examine the synopsis of history above stated, the extracts from published evidence given, and, if necessary, the respective articles upon which the whole history is based, for themselves. If *we* have omitted or misstated facts, or drawn erroneous deductions therefrom, it will afford us pleasure to set the matter right.

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Collodion and the New Organico-Iron Developer.

By NELSON K. CHERRILL.

[In our last we extracted from the 'Photographic News' Mr. Cherrill's very important modification of Mr. Carey Lea's new developer, which is attracting much attention among photographers. M. Cherrill has recently contributed the following additional information to the same Journal.]

ABOUT three weeks ago I made some trials with the new developer, using a collodion containing a much larger proportion of iodide than usual in bromo-iodized collodion. Finding that more success attended the experiment than was at first looked for, I have been induced to make up a collodion on purpose for this form of developer, the formula for which I now give you. I find that it is more sensitive than most of the collodion in the market, and it will give a much softer image in my hands than any of them. An addition of formic acid to the developer in the case of interiors and dark foliage, or very rapid work, will be found to work well with this collodion, or with ordinary bromo-iodized to which about half its bulk of plain iodized collodion has been added. Soluble cotton:—Mix

Nitric acid, sp. gr. 1·430, 11 drachms.
Sulphuric acid, sp. gr. 1·846, 10·2 drachms.
Water, 0·7 drachm.

When at the temperature of 130° F., immerse 50 grains of the best cotton wool, leave it in for ten minutes, during which time the acids must not fall below 120°, nor rise above 140°. When removed from the acids the cotton must be washed with the usual precautions, and dried with care before the fire; when quite dry, it may be made up into collodion by the following formula:—

Ether, pure rectified . . .	1 oz.
Alcohol, absolute	2 ozs.
Cotton	18 grains.
Iodide of cadmium . . .	6 „
„ ammonium . . .	7½ „
Bromide of cadmium . . .	3 „

To make this collodion rather more permeable, at first I added one drop of water to the above quantity. It gives a very creamy film in the bath, and with the new developer will be found to give the required intensity on the first application of the developer. It will be seen that the formula above is derived from two well-known sources, the formula for the pyroxyline being found in Hardwich's 'Photographic Chemistry,' and that for the collodion in the 'Year Book of Photography.'

The bath-solution should be slightly acid with nitric acid, as usually recommended.

The developer I see no reason to change, except that I think a slight reduction might be made in the quantity of acetic acid added. I find that the sulphuric acid may be kept for any length of time mixed with the gelatine: the proportion of sulphuric acid to two drachms of gelatine is best, according to my experience, as given before—namely, acid 1 ounce; gelatine 2 drachms; and I believe that this proportion does *not* act upon the whole of the gelatine, though I have now good reason to think that the gelatine and sulphuric acid *need not* be mixed in the proportion of their combining-numbers in order to decompose all the gelatine. In my last letter the equivalent of gelatine should have been given 696. The discrepancies which exist between the authorities on the subject of the formula for gelatine render any calculations of its decompositions, &c., at the best very uncertain. When formic acid is to be added to the developer, from 5 to 15 drops may be mixed with 1 ounce of the solution, containing 10 or 15 grains of iron, and 1 minim of acetic acid to each grain. The acetic I use is the common, not the glacial. It is necessary to remember this, as, if the glacial be used, about half the quantity will suffice; for ordinary work, with the developer of the same strength, about three-quarters minim of the acetic acid may be used to each grain. I find that cyanide has a much more solvent effect on the image produced by this than upon that produced by the ordinary developer. I hope to institute a series of comparative experiments on this developer as soon as the weather clears up a little, the results of which shall be faithfully communicated to you.

As addenda to the above, the publication of which has been accidentally delayed, I may add,

1st. That the failure of some persons with this developer, which has hitherto seemed somewhat mysterious, may be accounted for, in part at least, by the fact that some iron solution (the quantity not a matter of importance) should be added to the solution of glycosine before neutralization. I am at a loss to account for this, but have proved it by a series of experiments. An exceedingly small proportion of iron solution is enough to effect a complete change in the whole solution.

2ndly. A preliminary experiment made with a dilution of "gelatinous starch," or "amidin," in the place of gelatine or glycosine, promises to be successful. It gives the mechanical properties of gelatine, and does not seem to alter the *chemical effect* of the developer.

I may be permitted to add here (without entering into any controversy with Mr. Cooper —a course which could not add practical value to anything I have to communicate), that it appears to me that the explanations in his last of his mode of preparing the gelatino-iron developer are somewhat inconsequent, and that in modifying my method he has not secured any advantage either in the operation or the results.

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Modified Fothergill Process.

[From the 'Photographic News,' Oct. 20, 1865.]

It is not a little remarkable, as we have more than once observed, that the first dry collodion process invented, the collodio-albumen, continues to the present time, with slight modifications, the most trustworthy method of preparing dry plates. The one drawback it possesses is the extra trouble in preparation, which arises from the necessity of a double operation. Hence the greater simplicity of the tannin process (notwithstanding the uncertainties which attend it in some hands) constitutes to persons of limited leisure a merit which gives it an advantage over the older process. The modification of the collodio-albumen process known as the Fothergill process, although sufficiently successful in some hands to make it for some years a favourite process, was still attended with uncertainty. The amount of albuminate of silver formed in the film and the consequent quality of the negative, depended so much upon modes of manipulation which could not well be made definite, that much variety in result was common, and the process fell gradually into disuse, except in the hands of a few in whose practice success was the rule rather than the exception. Various attempts have been made to obtain a more definite amount of silver in the plates than that left by a certain amount of washing, of which the most successful was that proposed in our columns in February 1861, by Mr. Bartholomew, a gentleman to whom photographers are indebted for many excellent suggestions in dry-plate photography. This plan, which was subsequently independently suggested by Mr. Hannaford, consisted in giving the plates a perfect washing, and then treating them with an albumen solution to which a small portion of nitrate of silver had been added, the precipitate of albuminate of silver first formed being redissolved by the albumen or by ammonia in the solution*. It will be readily seen that more uniform results could thus be produced. In the ordinary Fothergill process, an uncertain amount of nitrate of silver was left in the film, and when the albumen solution was applied to the plate, this was converted into albuminate of silver. But this being the case, it is manifest that the result at that end of the plate upon which the solution was first poured would be different from that at the other end, the solution being weakened by flowing over the plate, and combining with the silver left in the film. On the other hand, if the nitrate of silver were perfectly removed by thorough washing, and a homogeneous solution containing a definite proportion of the organic silver salt then applied, more uniform results necessarily followed. It was also found that greater sensitiveness was secured by this mode of preparation. Mr. Fothergill himself has, we believe, adopted this method, and finds a great accession of sensitiveness as the result. Still, chiefly we believe for the want of some definite formula, the method has not come into general use.

Our attention has recently been called by Mr. Ackland to some experiments he has been making in this direction, in which a degree of certainty and an amount of excellence and of rapidity combined have been secured which we have not often found before in any dry process. The negatives produced were, we may say without exaggeration, technically perfect—having detail in the deepest shadows, and being free from chalkiness in the highest lights, the gradation exceedingly delicate, and the colour and general qualities of the negatives leaving nothing to desire. The first negative we saw was a test plate taken from the back of business premises in Newgate Street, containing dark red brick buildings in shadow, and a part of Christ Church Hospital in the light: the dark brick portions, in the obscurest light, possessed detail, the stone building was perfectly modelled and free from chalkiness, and the sky possessed that character which prints a delicate tint, instead of leaving a white mass. The results more resemble those from collodio-albumen plates by Mr. Mudd, or from collodio-bromide plates by Mr. Sayce, than anything we know. The exposure had only been thirty seconds, with a lens of four inches and a quarter focus, and a quarter-inch stop. We also saw a plate developed which had been exposed on the morning of the day on which we called. Nothing could be more satisfactory than the behaviour of the plate in development, the whole of the detail coming out gradually, but certainly, first presenting a detailed, but phantom image, and then, in the further treatment, acquiring full intensity, without the slightest tendency to spot, or stain, or fog, or defect of any kind; and, further, passing through the stages of fixing and washing without blister, or wrinkle, or any tendency to leave the plate.

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* It has been suggested that the effect of adding nitrate of silver to an albumen solution containing ammonia was to form oxide of silver, which was re-dissolved by the ammonia, the precipitate of albumen being formed by the nitric acid liberated from the silver, and that this was re-dissolved by excess of ammonia, the resulting solution containing albumen and oxide of silver dissolved in ammonia. We think it is more probable that a definite but complex combination takes place between the nitrate of silver, the albumen, and the ammonia. In Mr. Ackland's preparation no precipitate is formed.

There is another point of some importance in which Mr. Ackland has discovered that these plates possess an advantage over many kinds of dry plates as well as wet plates. As many photographers know, length of exposure does not always compensate for imperfection in the light. In some kinds of dry plates, Dr. Hill Norris's for instance, it is distinctly advised that they should not be exposed in a bad light, as good pictures cannot in such case be expected from any exposure. In the wet process, every photographer knows the disadvantages of long exposure in bad light. These plates will, however, yield as good a picture with fifteen minutes' exposure in a dull light as in one minute's exposure in bright light, a good quality of no small importance in many circumstances.

We should observe that Mr. Ackland is a very experienced photographer, having worked extensively almost every dry process in use; he therefore instinctively manipulates carefully; but he remarked to us that these plates seemed to require less than usual care in many respects. The cleaning of the plate was less carefully done than is common for wet plates, and, with the exception of adhering carefully to the precise proportions of the preservative solution, he used no especial care as to the materials employed. Any good bromo-iodized collodion would, he believed, answer; he had himself used their own (Horne and Thornthwaite's) ordinary wet plate collodion for portraiture. The bath, developer, &c. were such as we shall describe, but were not especially prepared for this process. He had compared these plates with tannin plates, tried under the same circumstances, and he had also tried these plates with the addition of tannin, but always to the disadvantage of the latter, the tannin having a tendency to give hardness and chalkiness.

The point of especial importance, which Mr. Ackland seems to have worked out satisfactorily, is not simply a satisfactory formula, but also a comprehension of its mode of operation. In the method adopted by Mr. Hannaford and others, on adding the silver to the solution of albumen a precipitate of albuminate of silver was formed, which was quickly redissolved in excess of the solution. It would be anticipated, however, from analogy, that on freely diluting the solution with water the albuminate of silver would be again thrown down. On this supposition it was believed that a plate treated with the preparation, and then freely washed, had a small portion of albuminate of silver, which permeated the film there thrown down and left in the finished plate. Mr. Ackland has found, however, that by using the proper proportions it is possible to mix the silver solution and the albumen solution without forming a precipitate, and that this mixture may be diluted to any degree with water without decomposing it, or causing a precipitate. It followed, therefore, that a plate treated with such a proportion, and then washed, might have the whole of the albuminate of silver again removed. It was this circumstance, doubtless, which introduced some uncertainty in the method, and caused unaccountable failures in some hands with a formula which was quite successful in the hands of others. It left the process, in short, in a similar state of uncertainty to the original Fothergill process, in which the amount of albuminate of silver left in the film was very much affected by the method of manipulation in washing, &c. Mr. Ackland has found, however, that an extremely dilute bath of acetic acid renders insoluble a certain portion of the albuminate of silver, and by its application secures an attenuated but even layer of the organic salt of silver on and in the film, thus leaving the plate in the best and most sensitive condition. It will be readily understood that such a process possesses the elements of certain and uniform working, and that a formula once found which gives the best results, there is little reason to fear that it will not do so in all cases. The formula with which Mr. Ackland has kindly furnished us for the benefit of our readers has in his hands proved altogether satisfactory, and he has not found it possible to vary without disadvantage.

A word before we give the details of formula and manipulation on the keeping of these plates. As the process, as we state it, has not had a long trial, we cannot give any absolute data; but assuming that the final result is a

Fothergill plate in its best state, we may argue from the keeping qualities of such plates as to the probable qualities of these. In regard, then, to the keeping of carefully prepared Fothergill plates prepared after the formula in general use four or five years ago, we have a remarkable circumstance to state, which Ackland mentioned to us. In the May of 1861 he changed his residence, and a certain camera which he was then in the habit of using was put away in his new residence in a place where it was lost sight of. A few weeks ago it was found, and, with its double backs, lent to a friend. A few days after he called to thank Mr. Ackland for having supplied the backs with plates, a circumstance which Mr. Ackland at once disavowed. It appeared, however, that when the backs were put away four years and a half ago, some Fothergill plates ready for exposure had been left there, and forgotten, with the camera, and kept thus without any especial care, they now yielded good negatives.

We must proceed to give the formula and details of working as Mr. Ackland has kindly supplied them to us. A series of stock solutions are first prepared, and we may call especial attention to the simplicity of the mode of preparation employed in making the stock albumen solution, which requires no laborious beating, and keeps indefinitely.

Prepared albumen:—

Albumen................	8 ounces.
Water..................	1 ounce.
Glacial acetic acid........	24 drops.

Mix the acid with the water, then add the mixture to the albumen, stir together with a glass rod for one minute; then, after resting one hour, strain through coarse muslin, and to the strained liquid add half a drachm of the strongest liquor ammonia.

This prepared albumen will keep good for years if kept closely corked, and is very clear and bright when the albumen, water, and acetic acid is nearly mixed together; but if beaten up in the usual manner, an opalescent liquid is obtained, quite unfitted for photographic purposes.

Solution A.:—

Prepared albumen	½	ounce.
Liquor ammonia	1	drachm.
Water	4	ounces.

Solution B.:—

Nitrate of silver	8	grains.
Water	4	ounces.

Dilute acetic acid:—

Glacial acetic acid	1	drachm.
Water	10	ounces.

Plain pyrogallic solution:—

Pyrogallic acid..........	100	grains.
Absolute alcohol	2	ounces.

Acid pyrogallic solution:—

Pyrogallic acid..........	8	grains.
Citric acid	2	grains.
Distilled water..........	4	ounces.

Acid silver solution:—

Nitrate of silver	30	grains.
Citric acid	30	grains.
Distilled water..........	1	ounce.

Coat the plate with any good bromo-iodized collodion (that used was Horne and Thornthwaite's), allow it to set well, then immerse for five minutes in a *slightly* acid bath, containing not less than 35 grains of nitrate of silver to the ounce. Take out, and after draining off excess of bath solution, wash thoroughly under a trap or in a tray with frequent changes of water: drain for two minutes, then pour on and off three or four times a mixture of equal parts of solution *A* and *B*, just previously mixed (as these two solutions when mixed speedily decompose, and, if used in that state, cause fogging): then drain for five minutes. Next pour on and off five or six times the dilute acetic acid prepared as above; then wash thoroughly, drain, and dry.

The exposure for stereoscopic plates is from 30 to 40 seconds, with lens 4¼-in. focus, ¼-in. stop. As a rule, the exposure is about half that required for collodio-albumen or Fothergill plates.

To develope, moisten the surface of the plate with distilled water; then drop into the developing glass ten drops of pyrogallic solution, and drain the water on the plate into the glass containing the pyro solution. Pour this over the plate two or three times, then allow it to rest until the sky and high lights begin to appear, and are indeed plainly visible. Then add *one* drop of acid silver solution to the developer, and continue pouring this on and off until the detail is fully brought out (using fresh solutions if needed), but of course with so small an amount of silver but little intensity is gained; then use the acid pyro solution with from ten to twenty drops of acid silver solution added to give the required intensity.

Note.—When the developer contains silver keep it constantly moving to prevent marbling.

Fix with hypo.

No preliminary coating is needed, as there is no slipping of the film.

We may add, that in development the principles generally recognized in dry-plate photography are especially available, and that a very considerable amount of control rests in the hands of the operator. If the exposure appear to have been at all insufficient, by continued development with the plain pyro detail may be obtained. If, on the other hand, the exposure be too long—and that is always the best direction for error—sufficient contrast may be readily secured by judicious use of the acid pyro and silver solutions.

In conclusion, we should remark that Mr. Ackland expressly desired us to state that to Mr. Bartholomew, the original suggester of this method of working, his thanks, and those of photographers generally, are due for the process; and we may add that whilst acknowledging with pleasure the originator, we feel that photographers are not less indebted to Mr. Ackland for working out and freely giving to the public the minute details upon which so much of success depends.—*Photographic News.*

REVIEW.

The Principles and Practice of Harmonious Colouring as applied to Photographs. By an ARTIST PHOTOGRAPHER. Fifth Edition. London: Newman, Soho Square.

If colour should be applied to photographs at all—and in many cases it is indispensable—it should be used with taste and judgment. That this is not always done is evident from the mass of coloured abominations which stare us in the face almost everywhere, and which have caused coloured photography to be looked upon with contempt by those whose artistic tastes have led them to prefer a good plain photograph to the same photograph after it had undergone the manipulations of the photographic colourist, whose only qualification would appear to be that he was once a provincial assistant scene-painter, as too many of the colourists of the present time appear, from their work, to have been.

Without enlarging further on how bad some of the coloured work offered to the public unfortunately is, we prefer to direct our readers to the book before us, that they may learn how good coloured photographs might be produced.

This admirable little manual commences with some capital advice on producing an artistic photograph, which evidently shows that the author is as familiar with the glass room as the studio. A chapter entitled "A Few Words on Portraiture," from which we make the following extract, will be read with interest by all professional photographers:—

> The position of the model may be varied without limit; but it should be the aim to secure grace and character, or both. Not less important than these in producing a satisfactory effect, is the presence of a purpose or object in the position. It is not intended by this to imply that the sitter should be in all cases engaged in some occupation; but care should be taken to avoid the suggestion of either entire vacancy or the self-consciousness of having a portrait taken. In the portrait of a lady a variety of resources from this may be found: she may be examining a bouquet, arranging a vase of flowers, buttoning a glove, examining a picture, reading a letter, &c. &c. In the portraits of gentlemen the same occupations would be less suitable; but others are available: even the conventional book held in the hand need not necessarily be arranged in the common-place conventional manner.
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> Entire repose is by no means inadmissible; but care should be used to secure the absolute feeling and appearance of intelligent repose, avoiding alike effort and vacuity. In all cases, straight lines and angles should be avoided as much as possible in arranging the position. The figure perfectly upright, without inclination or curve of any kind, is not graceful in anyone, and in a lady is especially awkward and undesirable. The figure may lean against a column, a chair, &c., or in a variety of ways a little inclination may be induced, and curved flowing lines secured. In standing, the weight of the body should rest on one foot; this will secure a more perfect sensation of ease and balance than can possibly be obtained when the figure is supported on both feet. Whatever action may be desired in the model should not be secured at the expense of ease; there can be no grace or pictorial effect in the suggestion of an over-strained muscle or dislocated limb.
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> As regards the question of composition, the greater the simplicity the more perfect will be the result. Elaboration or complexity is undesirable at all times in portraiture, and in photographic portraiture especially so. It is, however, an important point that a proper balance of lines, and of light and dark, be secured. If all the lines in a picture tended in one direction, a most uncomfortable effect would be produced; or if all the objects or masses were accumulated at one side, leaving the other bare and empty, the result would be just as unsatisfactory. All pictures should have at least one principal light, to which all the rest is subordinate. This, in portraiture, is generally the face, upon which the chief interest is supposed to be concentrated. The light may be repeated in varying forms and more subdued degree, so as to carry them throughout the picture—a general principle of chiaroscuro—requiring that some light should be carried into the deepest shadows, and *vice versâ.* It is desirable, also, that the weight, or heaviest part of the picture, both in colour and form, should be at the base. Thus, the standing figure of a man unsupported by accessories is very uncomfortable-looking: the picture requires a broader base. This may be secured by the arrangement of accessories, or even by the simple resource of a stick or umbrella in his hand, placed at an angle with the body. The best effect is produced when the darkest masses are arranged at the bottom of the picture, as that also tends to the production of equilibrium or balance. Let it be distinctly remembered, however, that these and all other effects in composition must appear natural, and, of course, the artifice must not be seen. The veriest smatterers in art have an impression that the pyramidal form is the most satisfactory in composition; but it requires the skill of an experienced artist to secure the effect without obtruding the means.
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> Contrast is an important element in pictorial effect—contrast in lines, and contrast in tones. The value of curved lines will be best made apparent by contrasting them with straight lines; relief, vigour, and brilliancy are obtained by due contrast and variety of tones. Contrasts, however, should never be harsh or violent. Masses of black and white brought crudely together, without gradation of any kind, certainly produce contrasts; but without anything of pictorial effect. One of

the most important qualities in a picture is *breadth*, of which crude and harsh contrasts are entirely destructive. The immediate juxtaposition of black and white draperies or accessories should therefore be as much as possible avoided. Both are necessary in a picture; but they should always be more or less graduated in their approach to each other. For this reason the background of a photograph is generally best of a middle tint, which does not contrast harshly with either dark or light draperies.

The reader will be struck with the completeness of the book: every branch of the subject has received attention, without any sensation of "padding" being apparent. There are chapters on "The Principles of Harmonious Colouring," in which the theory of colour is expounded; on the materials necessary and the various methods of their application to the photograph, all described in a delightfully simple manner; on water and oil-colour painting, crayons, enamelling positives, body-colours, mezzotint photographs, reproduction of improved positives, colouring on opal glass, colouring albumenized prints, enlargements, &c. &c. We extract the following method (which we have never yet seen described) of producing Imitation Ivory Miniatures, which have such an admirable effect when skilfully produced:—

A method of colouring photographs intended to be set in brooches, or in lockets, in imitation of ivory miniatures, has recently excited great admiration, and has been extensively employed by a few photographers; but, having been kept as a secret by those who have attained a knowledge of the method, it is not known to the general body of photographic colourists. The effect produced is so exactly like that obtained on ivory that it is only by those who have had great experience in coloured miniatures that the difference can be detected.

The method of proceeding is as follows:—The photograph to be coloured, which must be on plain salted paper, must be printed rather larger than that part of it which is required to be finished, in order that a margin might be left to paste on the frame which is about to be described. An aperture is cut in a piece of thin wood or mill-board larger than the part of the photograph to be coloured, the print is now damped and the edges pasted on to the frame. When dry the paper will be found to be stretched tight, exhibiting a smooth surface to work upon, and the back of the part required will be clear of the frame. The picture should now be painted in water-colours, as described in a former part of this work, with the exception that the colours must be more forcible, and the face of the portrait darker than will be necessary in the finished result—the after-operation making the picture paler than before the wax s applied.

When the picture is quite finished, and it is as well to avoid any after-alteration or corrections, melt a little pure white wax in a porcelain capule, and, holding the picture before a fire, apply the wax to the back with a brush. The picture will appear to darken all over, but will regain its colour on cooling. It should now be cut out of the frame and backed with a piece of warm-tinted or cream-coloured paper. If any alterations are absolutely necessary they may be made by mixing a little soap with the colours employed.

In conclusion, we cordially recommend this book to our readers, as containing more information, with less mere verbiage, than any other work of the kind of twice its pretension and six times its price. Where the principles of art are laid down, they are stated in a sound, comprehensive, and simple manner, without continual quotations from lectures on painting, or pages of diluted Ruskin, which we find so common in lessons on painting, and art hints for photographers from *quasi* artists. The style of the author is a model of simplicity and perspicuity, and renders the book, which is chiefly intended as an instructor, at the same time a most interesting and agreeable companion.

MISCELLANEOUS.

The Dublin Awards.

Early in the month the list of awards and the reports of the jurors of the Dublin International Exhibition were announced. The report of "Class F.—Fine Art (Photography)," as the department devoted to our art is honourably styled, is a long, well written, and appreciative review of the salient features of the Exhibition, with which, with one or two exceptions, I entirely concur. My chief exception is to the injudicious compliments which are paid to Mrs. Cameron's well-known out-of-focus pictures, and which do not read as if they had originally formed part of the report; and it is to be noted that the jurors did not back their opinion by the award of a medal, "Honourable Mention" being considered sufficient. I have very little hopes of pictures like these, and should be sorry to see the infection spread. In most other respects the report is capital, and contains, besides many practical hints, much encouragement to beginners in photography in sentences which are quite epigrammatic, some of which I should like to extract, had not the report and a leader thereon already appeared in the 'News.' And this reminds me that the report has only been published by the 'News' and the 'Journal of the Photographic Society.' What *could* have been the reason of the other Journals foregoing such a capital bit of copy, and depriving their readers of a report which will be required for reference for years?

The awards appear to have been very carefully and equitably bestowed, but there is a little discrepancy in one case between the report and the list of awards, which must have been an oversight. The report speaks very favourably of Mr. Brothers' pictures and experiments by magnesium light, but neither a medal nor "Honourable Mention" is awarded. Is it too late to remedy a manifest oversight? Another curious omission is that of the United Association of Photography; although they contributed largely to the Exhibition, they received no award.—*Photographic News.*

The Dangers of Cyanide.

When will cyanide be banished from the photographer's laboratory? Every week we hear of somebody being either maimed, paralyzed, or killed by this deadly, and, to a photographer, totally unnecessary poison. Several letters have lately appeared in the 'News,' describing its dreadful effects. Many people are still so ignorant of its action that they do not know that it is a poison. Only yesterday a gentleman, who is commencing photography, told me that a quantity of it was sold to him by a chemist without any caution, and that, finding a lump too large to go into his bottle, he put it between his teeth and bit it through! Of course nothing but very prompt measures saved his life. One of its peculiarities is, that you may use it for cleaning the hands for years with impunity, and that, after a time, finding the blood in some special state, it commences its attack, and the victim will not believe that the cyanide is the cause of the pain he feels. The intensity of the pain experienced by those who suffer from this poison is, perhaps, the most awful that could be imagined.—*Photographic News.*

Photography and Book Illustration.—Professor Hofmann's recently issued excellent manual of 'Modern Chemistry,' a work which all our readers should possess, is profusely illustrated, the engravings having been executed from photographs of the various instruments taken for the purpose. The Professor presented each of the gentlemen present at the farewell dinner, previous to his departure from England, with a copy of the work, and a fine photographic reproduction, now before us, of the scroll on parchment commemorating the occasion. This reproduction was admirably executed by Mr. Spiller.

Mr. Thurston Thompson informs us that he found the magnesium lamp of Mr. Johnson to answer his fullest expectations in copying the pictures in the House of Lords. 'Wellington meeting Blucher at Waterloo,' by Maclise, is the picture which has yielded such beautiful results, and not the 'Death of Nelson,' as has been previously stated.

Our attention has been drawn to observations contained in the last two numbers of the 'Photographic Notes,' by several friends, and especially by the receipt of a kind and honourable letter from Mr. Ross, containing sentiments which we thank him for, and fully reciprocate.

The statements we decline to notice in this Journal, and have placed the case in the hands of our legal adviser, to deal with it in any way which he shall think fit.

Mr. A. W. Bennett is about to add to his series of "Photographic Gift-books" an edition of Scott's "Marmion," and a work by Mr. F. G. Stephens, entitled "Flemish Relics, Architectural, Legendary, and Pictorial;" also two smaller works on the "Ruined Abbeys and Castles of Yorkshire" and "The Border."

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

J. W. (*Anglesea*).—The collodio-albumen, in our opinion, is still the best dry process. The Fothergill, as lately improved by Mr. Ackland, is an excellent and easy process. The uncertainty formerly attaching to its practice has been entirely removed by Mr. Ackland's modification. We look upon the tannin process as a mistake. This process, from its continual modifications, has been more troublesome to photographers than all the other processes together.

X. F.—If you tone with acid chloride of gold, you will certainly get more or less of sulphur toning as well.

Zero.—We have repeatedly given formulæ for the process you mention. See the Journal for December 1863.

George Thomas.—If this correspondent will send his address, we will communicate with him.

Towcester.—We have used the bellows form of camera for many years, and have no fault to find with it. We cannot recommend any special maker in this place. Consult our advertising columns.

T. R. E.—The streaks on your negative are probably caused by the condition of your bath, and not by the developer as you suggest. Make the bath neutral with carbonate of soda, and place it in the sun for a few days; then filter, and add three drops of nitric acid to each twenty ounces of the solution. If it does not then work clear, add one or two drops more of nitric acid.

Peter C.—We have no faith in the tannin process. See answer to J. W.

W. Founds.—Rive paper gives a more vigorous image than Saxe paper, but is more liable to blister. The blisters usually dry flat and invisible.

R. W.—A north light, certainly.

G. D. (*Inverness*).—We employ methylated spirits in the developer, and find no disadvantage from its use.

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THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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PHOTOGRAPHIC SOCIETY.

THE next Meeting of the Session will take place at King's College, on Tuesday, January 9th, at eight o'clock, when Mr. Jabez Hughes will introduce the discussion on the New Developer by a short paper entitled "Further observations on the Preparation of the Iron Developer so as to produce dense negatives." Mr. Cherrill and Mr. Cooper have also promised to read short papers on the subject.

MEETINGS OF THE SOCIETY, 1866.

1866.	Tuesday, Jan.	9
,,	Feb. (*Anniversary*)	13
,,	March	13
,,	April	10
,,	May	8
,,	June	12

NOTICE.—*Special Meeting of the Society.*

A Special Meeting of the Society will be held at King's College, on Tuesday the 19th inst., at 8 o'clock, in accordance with the Resolution contained in the report of the Meeting of the 13th inst.

Mr. WOODBURY'S Photo-Relievo process was brought before the Society at the last Meeting of the Society, on Tuesday evening, and attracted the largest gathering of members and their friends we ever remember, the large room in which the Meetings are held being densely crowded. We believe that many scientific gentlemen made special journeys to London for the purpose of being present. Mr. Woodbury's object being to illustrate the practical working of the process, he purposely made his paper as short as possible. After his paper had been read, Mr. Woodbury proceeded to produce impressions from his intaglio moulds. The first few prints were failures; but even these failures were interesting, as showing one of the peculiarities of the process. In order to secure perfect results, it is necessary that the consistency of the coloured gelatine, of which the prints consist, should be suited to the temperature of the room in which the operation is carried on; the inventor having attended former Meetings of the Society, suited the strength of his gelatine to the temperature which he had before experienced, but the crowded state of the Meeting made the room so warm that it upset his calculations. This, however, was soon remedied, and many beautiful impressions were printed.

Our readers are already in possession of the method by which these prints are produced. It might be interesting, however, to state briefly the method by which the metal moulds used to print from are obtained, and which was not clearly stated in the paper.

A piece of talc is prepared with a mixture of gelatine and bichromate of ammonia. This plate, which is sensitive to light, is exposed under a negative, or, as Mr. Woodbury prefers, the impression is obtained by aid of the solar camera. The gelatinized talc having been exposed, is now laid in a dish of warm water, which dissolves away the parts not affected by light, leaving a plate with the parts representing the darks of the picture in relief.

The next part of the process is to produce a printing-mould or *cliché* from the gelatine plates. This can be done by the electrotype process, but Mr. Woodbury has found that simple pressure in a hydraulic press of the impression in gelatine into soft metal is to be preferred.

The metal mould being now ready, we now arrive at that part of the process which was exhibited to the Meeting, and which is better described in the paper read and the discussion thereon.

LONDON PHOTOGRAPHIC SOCIETY.

ORDINARY GENERAL MEETING.

KING'S COLLEGE, LONDON.

TUESDAY, DECEMBER 12, 1865.

Dr. WRIGHT (pro tem.) in the Chair.

The Secretary read the Minutes of the last Meeting, which were confirmed and signed.

The CHAIRMAN said it was his duty to offer to the Members of the Society the apologies of the Council for their delay in entering the room, and also to inform the Meeting that the Council had been engaged in the consideration of a most important question. They had gone into that question with the utmost care and assiduity, and had come to a resolution respecting it, which he would now read without further comment. It was to the following effect:—

> "At the Meeting of the Council of the "London Photographic Society, December 12, 1865, it was unanimously "resolved, that Mr. Glaisher having "laid before your Council a long correspondence between himself as Vice-"President, and Mr. George Dawson "and Major Russell, your Council desire to express their full conviction "that the statements made in the "'British Journal of Photography,' of "November 24, 1865, personal to Mr. "Glaisher, are entirely unfounded and "unjustifiable, and the Council desire "that a Special Meeting of the Mem-"bers of the Society be called to consider this most serious and unfair "attack on one of the Vice-Presidents "of the Society."

It was in the power of the Council to appoint a day for the purpose mentioned in this resolution, and accordingly they had named Tuesday, the 19th December, at 8 o'clock. He now moved "that J. Glaisher, Esq., one of the Vice-Presidents of the Society, take the Chair, and preside over the business of the evening."

The motion was carried by acclamation.

On taking his seat, Mr. Glaisher said he had felt himself compelled to inform the Council that, charged as he was in the 'British Journal of Photography' with dishonourable conduct, he could no longer consent to occupy the chair, unless that charge was fully investigated. No one present upon whose honour there had been the slightest imputation would consider it right to do so. The Council having passed the resolution just read, he had agreed to occupy his accustomed position this evening. He hoped there would be a good attendance of Members at the Special Meeting, when he should have the opportunity of reading the correspondence which had passed between himself, Mr. Dawson, and Major Russell, and thus enable them to judge whether he had done right, or whether he had done wrong.

The following gentlemen were elected Members of the Society:—

JOHN MAYALL, Esq., jun., 91 King's Road, Brighton.
JOE P. MAYALL, Esq., 91 King's Road, Brighton.
EDWIN MAYALL, Esq., 224 Regent Street, W.
THOS. HY. COLLINS, Esq., 224 Regent St., W.
NELSON K. CHERRILL, Esq., Belmont Lodge, Lea, S.E.

The CHAIRMAN said, in accordance with the 7th rule of the Society, which provided for the annual election of certain of the Officers, the following changes had been proposed by the Council.

President.

THE LORD CHIEF BARON, F.R.S.

Vice-Presidents.

To Retire.	For Election.
Mr. F. BEDFORD.	Mr. F. BEDFORD.
Treasurer.	
Mr. HAMILTON.	Mr. H. WHITE.
Council.	
Mr. G. SHADBOLT.	Mr. W. WARWICK KING.
Mr. HENNAH.	Mr. JABEZ HUGHES.
Hon. W. WARREN VERNON.	Mr. RUSSELL MANNERS GORDON.
Major GRESLEY.	Mr. E. KATER, F.R.S.
Mr. J. DURHAM.	Mr. J. DURHAM.

Mr. W. Woodbury then read the following paper:—

A New Photo-Relief Printing Process.

THE new process which I have the honour of bringing before your notice this evening is the result of some fifteen months' close experiments, as during that time I have devoted myself exclusively to the perfection of what seemed to me to be a great want in photography—a process which should secure permanence, cheapness, and expedition in working. I shall not trouble you with many details as to the *modus operandi*, as they have already been fully published in the photographic papers, and you will be better able to judge of the process by seeing it in operation.

I will first endeavour to illustrate the principle on which this method of printing is based. On the table is a small bath composed of two pieces of plàte glass arranged in a V-shape, meeting at the bottom, and opening out at the top to the space of about 1 inch; this is filled with a solution of gelatine and colour, and illustrates fully the principle involved. The broadest part, containing a thick layer of material, produces a black; and as it gets thinner towards the bottom, the colour gradually merges into white. Now by having a metal intaglio mould in which the dark parts of a photograph are represented by a deep hollow, the middle tints by hollows half the depth, and so on until we come to the highest surface of the mould, which represents the whites of the photograph, by filling this mould with a mixture of coloured gelatine—and, for the purpose of immediate illustration, with coloured water, we make at once a photograph in water, the shades being where the layer of water is deepest, and so gradually getting thinner till we come to the white parts. By adding a little gelatine to this coloured water we are able to preserve this shape, and detach it from the mould, owing to the setting-properties of the gelatine. By laying a sheet of paper or glass on the mould, and squeezing out all superfluous matter, the gelatine on setting adheres to the paper, and can be lifted from the mould. This constitutes the principle on which the whole is based. The metal mould is obtained by pressure from a gelatine relief which is produced by the action of parallel rays of light on a sheet of gelatine and bichromate, and then washing away all soluble parts, leaving a *cliché* in different degrees of relief according as the light has been allowed to act on the gelatine to a greater or less depth. This mould, when dry, is placed in a hydraulic press in contact with the metal, and an exact reverse is by this means obtained, but in a more solid material. I laboured long to produce these moulds by the electrotype process, but found it too uncertain for any practical use. Having obtained this mould, the remainder of the process will be better shown by illustration, which is my chief purpose this evening.

It would be of little use my alluding to the number of applications that this process is capable of, as they will naturally suggest themselves to you all; some few are on the table for your inspection this evening.

Mr. Sebastian Davis asked Mr. Woodbury if he were correct in supposing that his process consisted, in the first instance, of printing from the negative upon talc, covered with gelatine, mixed with bichromate of potash in certain proportions, after which parts of the surface were dissolved away, leaving the gelatine in definite thicknesses corresponding to the amount of the action of the light upon the prepared talc. It appeared to him that the gradations of tint arose primarily from the height of the gelatine at the particular points.

Mr. Woodbury said it was so.

Mr. Anthony, of New York, was introduced to the Meeting at this stage of the proceedings (while Mr. Woodbury was engaged in preparing some prints), for the purpose of bringing under the notice of the Society a new description of paper for the use of photographers. He said he was not the inventor of the improvement; it was the discovery of a gentleman of the name of Brinkoff, of New York, who had requested him to bring some specimens over to this country and exhibit them. The object sought to be accomplished by the inventor was the preparation of a perfectly dead white paper without any lustre, and upon which a painter could colour with as much freedom as upon ivory. The result of his ingenuity was to produce a paper perfectly hard, upon which the high lights could be developed as on ivory, and upon which any amount of colour could be washed in. One great advantage of this paper was, that the picture did not sink into the substance of it, and as brilliant a picture could be produced upon it with 30 grains of silver as was obtained on ordinary paper with 60 grains. Mr. Anthony exhibited some portraits, coloured and plain, from the same negative upon ordinary paper and upon the paper prepared by Mr. Brinkoff.

Mr. Mayall asked whether there was any difference in the time required for printing on this paper.

Mr. Anthony replied that he been informed there was not.

Dr. Diamond asked whether the process of manufacturing the paper was a secret.

Mr. Anthony said it was.

Mr. Mayall said he thought as this was the first time the Society had had the pleasure of meeting an eminent American gentleman who represented photography in the United States, the members would embrace the opportunity of offering to him a most cordial welcome, and would rejoice in showing to him all that courtesy which a stranger was entitled to on coming amongst them. He was sure the parent Society would hold forth both its arms to receive him, and would gladly accept from him and from photographers in any part of the world all the instruction and information they were able to offer. With reference to the subject introduced by Mr. Anthony, he mi state that that gentleman was kind enough on Saturday last to give him a piece of the new description of paper. He was sorry that in consequence of the dullness of the weather since that day it had been impossible to obtain results with it in anything like that degree of certainty which might be arrived at before giving an opinion upon its merits, but, so far as he could see, this paper had many advantages over the ordinary paper employed. The mode of its preparation he believed had been patented; and he would only add, that he thought, before this Society pronounced any opinion upon the subject, it would be well if some member would write and read a paper upon the subject of paper as a whole. Some years previously he (Mr. Mayall) invented and, unfortunately, patented (which he was sorry for and had always been ashamed of ever since) a process without paper altogether, but it was found that it absorbed such an amount of hyposulphite of soda that it could not be got out. He therefore let the thing drop and the patent with it; but he had recently turned his attention again to the subject, and in the most accidental way had discovered how they could fix it. Since he had seen Mr. Anthony's paper it had struck him whether the gentleman who invented it had taken any part of the material with which he coated it, so as to prevent the fibre of the paper coming up. He would be happy to read a paper on the subject before the Society, unless any one else would do so. From his examination of the specimen Mr. Anthony had shown him, he thought—taking a long guess—the materials employed were, a small portion of isinglass, a small quantity of alum, and perhaps a little gelatine along with it. Whatever it might be, however, he was certain, from experiments tried so far back as 1853, that they could coat a paper with collodion, if that process were not too expensive, by making a bath of collodion just the same as they did with nitrate of silver, and dipping the paper into and withdrawing it very slowly. In that way he thought they would get a surface of collodion on the paper which would be applicable to the magnificent collodio-chloride process perfected by Mr. G. Wharton Simpson, which he (Mr. Mayall) regarded as one of the most important contributions made in printing since the art of photography was invented. He was sure that amongst the eminent men present that evening the question could not fail to be propounded, whether paper could not be coated or impregnated with some new substance, or with some substance already familiar to them, so as to allow of its taking the place of glass in Mr. Simpson's process. The sulphate of barytes was the substance which he (Mr. Mayall) employed, held together in some cases with gelatine, and in others with fish glue. He was certain that isinglass was a most valuable substance, if used very thin, for the purpose of preventing the image from sinking in. Looking at the specimens exhibited by Mr. Anthony, he was justified in saying that he had produced quite as good an image by employing a solution composed of, say, 1½ grain of isinglass to 1 ounce of water, and about ¼ grain of common alum. This mixture was boiled, and the serum taken off and filtered while warm through glass and cotton. The solution was then floated upon the surface of a bath, just as was done with albumen. In this way a surface could be obtained into which the image would not sink at all. He was now speaking of the very early days of photography, when they were obliged to take paper negatives, and when, as his friend Dr. Diamond knew, they experienced great difficulty in preventing the ~~sinking~~ of the image. If the process brought under the notice of the Society by Mr. Anthony would enable them to produce a negative upon the surface without being in the surface, it would be of equal value for taking positives, and would do away with the use of albumen. There could be no doubt that though albumen did give a beautiful surface, the prints did deteriorate after a length of time. If by the use of sulphate of barytes, or by a solution of barytes with isinglass, or with gelatine, or some other substance, get such a surface, a very great difficulty which they had now to encounter would be overcome. He thought the Society should express their thanks to Mr. Anthony, if only for drawing their attention to this subject. It was a singular thing how often an important fact was lost sight of until by some circumstance or other attention was directed to it. They all felt that the paper they were now obliged to use was by no means perfect, the image sinking in as it always did, except when using albumen, and therefore they should feel obliged to any person who drew their consideration to any means which promised an improvement in this direction. If they could by the use of some substance obtain, at a reasonable price, a paper which would enable them to secure the marvellous effect of ivory, and he for one thought they could, one of the chief difficulties of plain photography would be overcome, and their art would receive a considerable impetus. In that way, whether by some patented or unpatented process, he hoped they would soon obtain a great success in what was called salted paper printing. He felt sure he was expressing the opinion of the Meeting when he said that the Society had great pleasure in welcoming a gentleman so distinguished as Mr. Anthony of New York, who had brought with him some beautiful specimens of coloured and plain photographs, which showed a considerable advance over the old process of printing. With reference to the substances that might be employed in the preparation of paper, he might state that rice, semolina, arrowroot, and the whole of that class, should be taken into account when they came to make experiments.

The **Chairman** said it was not necessary that he should say anything more than that the Members of the Society had the greatest pleasure in welcoming Mr. Anthony of America, the country of Mr. Carey Lea, to whom photography owed so much. He would only express the hope that Mr. Anthony would convey to their brethren in America the assurance of the interest they experienced in his presence on this occasion.

The vote of thanks was carried by acclamation.

Mr. **Callaghan** exhibited some large photographs taken by Steinheil's patent Periskop.

Mr. **Hughes** asked for information respecting the actual size of the pictures, the focal length of lens employed for their production, the angle subtended by the lens, and the length of exposure, so as to enable the Meeting to judge of the expense of the process.

Mr. **Callaghan** said he was not at the present moment in possession of all the information sought, but believed that he should be supplied with it shortly. All that he could furnish at present was simply a description of the lenses with which the pictures were produced. No. 6 was done with a lens of 2¼ inches diameter, focal length 22¾ inches; diameter of the base of the picture 31½ inches. No. 5 was produced with a lens 1⅝ inch diameter, 13¾ inches focal length, diaphragm ⅛th. He was not able to state the time of exposure.

Mr. **Johnson** exhibited some photographic views taken with the pantascopic camera by a small lens, 8¼-inch focus. The pictures measured 19 inches, the subtended line being 125°. The form of the camera employed enabled him, he said, to give a different exposure to the sky from that of the foreground, producing as a consequence a fine atmospheric effect. He proposed on a future occasion to make a few remarks on these pictures, and to exhibit a larger series of them.

The thanks of the meeting were awarded to Mr. Johnson.

The consideration of Mr. Woodbury's process was now resumed, and that gentleman exhibited the mode of taking impressions from the lead mould by pouring upon it a solution of coloured gelatine, laying the paper on, and then pressing out the superfluous liquid.

Dr. **Anthony** said, in order to obtain a perfect print, it appeared that great care must be taken to lay on the paper so as to keep it free from the effect of bubbles. He wished to know whether it was necessary that the fluid should be kept at a certain temperature.

Mr. **Woodbury** said he had not yet been able accurately to decide that point. He had found that a certain degree of liquidity enabled him to produce a better impression at one time better than at another. This depended a great deal upon the strength of the solution employed. He would use a stronger solution of gelatine in warm weather than in cold.

Mr. **Hughes** understood the process to be this. Mr. Woodbury first took a negative in the ordinary way, and then obtained a print with bichromate and gelatine, the peculiarity of which was, that the action of light was registered not by difference of colour, but by relief; certain portions of the picture being raised, and other portions nearly bare. That print being obtained direct from the negative, was, of course, the reverse of the negative, and it was then brought in contact with a plate of soft metal, and, when dry, was placed under heavy pressure, when the gelatine was sufficiently hard to make indents into the metal, producing an impression the reverse of the gelatine plate, and thus becoming a negative itself. The indents in the plate were capable of receiving a translucent ink adapted for the purpose to register the impressions upon paper. Mr. Woodbury employed warm gelatine and a colouring-matter for filling in the indents, and by pressure he squeezed the paper down upon them, and thus obtained, speaking photographically, a positive impression from the metal negative.

Mr. **Mayall** asked in what this process differed from Paul Pretsch's process. It appeared to him that Mr. Woodbury was, as it were, taking casts.

Mr. W. W. **King** said, whatever it was, casting or printing, it seemed to him to be an extremely valuable process. He would like to have information as to the number of prints which could be produced per hour, as that would enable them to judge about the probability of this process superseding wood or other engraving. He knew that scientific men were looking forward to its development as a matter of great importance, considering that it would probably be a less expensive, and certainly a more accurate method of illustration than any other.

Mr. **Woodbury** said he thought that with three presses a person who had had practice might produce as many as three prints per minute. The cast he could hardly say anything about, but it would be very trifling. One ounce of gelatine and a sixpenny tube of colour would be sufficient for four or five hundred prints, the only other expense being the paper. In reply to further inquiries, he said any number of moulds could be taken from the same bichromate negative. The colouring-matter he employed was a mixture of lampblack, crimson lake, and sepia. He had not found that the moulds wore out. A soft negative was most desirable for the process; it did not matter how thin, provided all the details were there. His apparatus being small, he had not as yet attempted to produce large pictures.

Mr. **Mayall** said he was sure the few questions that had been put to Mr. Woodbury had not been put in any invidious sense. The question of the number of prints which could be produced per hour was a very important one, when contemplating the employment of this process in the illustration of books. If it could be cheaply applied to the illustration of scientific works, there could be no doubt this was a most valuable discovery, and would be a great acquisition to publishers. But the idea had just occurred to him, if the impressions could be produced with so much indentation as he saw on the plates exhibited, would not they be sufficient to carry ordinary printers' ink? If so, all that was necessary would be to mount the plates on blocks and use them in the usual course of printing. Whether however that could be done or not, it was certain that, if the process as employed by Mr. Woodbury could be rapidly and cheaply applied, in practice it would be most valuable. He believed that a new era in the illustration of books would date from that evening, and he had no doubt the attention of photographers would be directed to the consideration how far their pictures could be transferred to wood blocks.

Mr. Cooper said he thought Mr. Mayall in his remarks had forgotten that the principal point in Mr. Woodbury's process was the use of a transparent ink. If printers' ink were used, none of the delicate half-tones would be brought out, owing to the opacity of the material. The great beauty of Swan's carbon prints was that they were transparent, so that the half-tones showed through.

Mr. Cole called attention to the fact that crimson lake and all the lakes were not permanent; the colours, he said, invariably faded.

Mr. Hughes said the gelatine employed by Mr. Woodbury was entirely transparent, and by union with the colouring-matters he was able to produce translucency, which was semitransparency. The pictures were in reality casts. They were in relief, various parts of the paper holding different amounts of gelatine. Where the greatest amount existed, there of course was the greatest amount of colouring-matter; and it was by these inequalities of the same materials that he obtained the gradations of tone. Printers' ink was of the same tone all through, and the finest points of a picture produced by it would be as black as the other parts, and was therefore unfitted for Mr. W.'s process.

Mr. Mayall said he recollected that, as far back as 1843, Mr. Johnson, of New York, went through a series of very careful experiments of engraving upon daguerreotypes, producing the engraved surface by the use of sulpho-muriatic acid, and employing a number of manipulations. He (Mr. Mayall) believed that he had one of the plates so produced still by him. The object was to employ such plates with ordinary printers' ink; and he thought he could obtain a picture from the one he had in the same way as by the present process. It should be borne in mind that Mr. Fox Talbot was now engaged upon a similar process, and it would be well if Mr. Le Neve Foster, or some other gentleman, would undertake to bring the whole question before the Society, so that they might be able to found a judgment upon the merits or demerits of each.

Dr. Anthony thought the process of Mr. Woodbury differed entirely from the printing process, because by it the paper when damped was caused to enter into the cavities of the mould, from which it carried, by adhesion, a certain thickness of the gelatine and colouring-matter, the gradations of light and shade depending upon the greater or less relief produced.

Dr. Wright said, to his knowledge communications had been within the last few weeks sent to Mr. Woodbury, to know whether by his process he could illustrate some medical works.

Mr. Davies asked whether with large plates a practical difficulty might not arise in getting rid of the superfluous gelatine, especially in cases where it was desired to preserve the high lights in the centre of the picture, inasmuch as the gelatine would be inclined to set.

Mr. Woodbury said he had not found it so; and inasmuch as with a large plate it would be used in larger quantity, it would keep its warmth for a longer time.

Mr. Anthony inquired the amount of pressure required to produce a mould of the size exhibited.

Mr. Woodbury said, about thirty tons. He thought the standard would be about four tons for every square inch. In reply to further inquiries by several Members, he said he did not think there would be much more difficulty in producing larger subjects. Several metal moulds could be obtained from the same gelatine—with care as many as wanted; and any number of prints could be taken from one mould, as there was no friction to destroy it. He had not considered whether it would be better to use the first mould obtained as a matrix, and multiply copies of it by the electrotype process. He thought, however, that it would be difficult to get it flat again, and he had not found any deterioration between the first impression and the last.

Mr. Hughes said, in the early daguerreotype days, great hopes were entertained of being able to etch the images produced, and something was done in that direction; but the great difficulty was, to get sufficient depth of image. If Mr. Woodbury's process could then have been brought into use, better results would have been secured than now. There was a certain thickness in the daguerreotypes; but there was a weakness in the image, a want of force and power, and the deepest depths could not contain a sufficient quantity of ink. In the process of Mr. Denys, the mercury was dissolved away after it was attached to the silver plate to form the daguerreotype image. Mr. Goddard discovered a process which seemed to have some bearing upon the present subject. It was, that instead of exposing a daguerreotype plate, after the light had acted upon it, to the vapours of mercury, it was washed in hyposulphite; and when the iodide and bromide of silver were entirely removed, there was found upon the plate a difference of thickness—an inequality—exactly corresponding to the quantity of light which had acted upon the plate. In reality there was an intaglio upon the plate. Taking the plate in that condition, he treated it as a copper plate, and employed ordinary printers' ink in the production of pictures. But the impression was not sufficiently strong and effective to allow of its competing with ordinary copper-plate engraving.

The Chairman, in the name of the Society, thanked Mr. Woodbury for his valuable communication, which he regarded as one of the most valuable character, and full of the greatest promise when some of the minor working difficulties inherent in a new system were overcome.

Mr. Woodbury briefly acknowledged the vote of thanks.

The Chairman called attention to some specimens of Mr. Swan's carbon process.

Mr. Simpson exhibited a photograph printed by a process which he said was analogous to that just brought under the attention of the meeting. Mr. Woodbury and Mr. Swan were independent inventors of a similar process; and the latter gentleman had sent this specimen to him, that it might be exhibited at the same time. The principle in each case was the same, but there was some slight difference in the mode of producing the printing-plate. Mr. Swan took one of his carbon plates, and while it was still wet, he electrotyped it, producing a *cliché* from which, with coloured gelatine solution, he printed in the same way that Mr. Woodbury did.

Mr. Cooper exhibited a picture produced with the new organic developer.

Mr. Simpson said Mr. Swan was now enabled to print by means of a very simple actinometer, the principles of which he proposed to explain at the next Meeting of the Society.

The proceedings were then adjourned.

The following paper by Mr. Mayall was read, and the discussion thereon took place at the Meeting held on the 14th of November; but owing to the time necessary for engraving the diagrams and the closeness of the day of Meeting to that of publication we were reluctantly compelled to leave the paper and report over until our present Number.

On the Construction of a Photographic Glass Room. By J. E. Mayall, Esq.

Numerous articles have been written on this subject with more or less ability, but it is no disrespect to any one to say that our knowledge of the best construction of a glass room is still empirical; that is, no principle has been established which applies to all glass rooms, whereby the following important results can be obtained:—

1st. The light to be under control in winter and summer,—to add on to the deficiency of the one; to subtract from the redundancy of the other.

2nd. To be able to concentrate the light on the most important points of the figure; to blend and soften off into positive shadow the less important parts.

3rd. To render age less garrulous; make beauty more lovely; to impart an expression of intelligence where nature has not been over bountiful; to light up the intellect, and to impart the quality of power, in those heads on which she has lavished her most precious gifts: in short, to be able to present human nature in its best form, by the aid of a camera and a properly lighted room.

This seems a rather formidable list; and I am not unmindful that there are persons, otherwise well-informed, who sneer at the photographer as a presumptuous creature for venturing to tread on the domain of art. His best efforts are unblushingly appropriated without acknowledgement. If every stolen idea from the photographer could cry out "stop thief," an army of policemen would be necessary to take into custody the delinquents, that gleam and shine in the light of day, from the walls of every public exhibition of paintings, not only in our own country but in every other where art is really advancing and honest truth has taken possession of public taste. The gander necks, the long chins, the saucer eyes, brows like the rainbow, and mouths like that of a cherub on the tombstone of a country churchyard, with which our forefathers of the last generation were ignorantly contented, won't do now. Oh, no! all this is changed; every well-filled photographic album is a silent monitor, not only what to do, but what to avoid doing, and above all *what to dare to do* with the wondrous perspective which the perfect optical instruments of the present day have placed at the disposal of the intelligent photographer.

The solar camera is coming down on art like an avalanche; its power, its beauty, its delicacy, all combine to sweep away cobweb inefficiency; a badly drawn portrait, that might be like the original or accidentally like anyone else, will soon be a thing of the past. All true artists will hail with delight this harbinger of truth, this real living presentiment of a man, instead of the conventional suit of clothes with which the Moses and Sons of art have hitherto contrived to dress up the minds, as well as the bodies, of their afflicted and much injured patrons.

This theme is capable of extension; but I leave it in your hands, and at once proceed to the immediate business of this paper, on the construction of a glass room, which I hope may contribute to greater perfection in things photographic.

Example:—

If I suspend a silvered ball in the centre of a square room and open a window to the left hand, the light impinging on the ball will radiate from a central pencil, and gradually but imperceptably faint away past the apparent edges into obscurity. A sense of roundness is imparted to the optic nerve, and a very clear and well-defined image of the ball is produced.

Now if I open another window in front of the ball and allow a second light to impinge on the surface of the ball, another pencil of light will be formed opposite this second window; portions of the ball which were in the first instance in positive shadow will now be illuminated, and the lights from the two windows will cross each other, and a confusion of shape will be produced on the optic nerve, an effect of elongation will be produced on the side of the ball next to the left-hand window.

Suppose I open another window on the right-hand side of the room: a third light will illuminate the ball, producing still greater confusion of form, bulging out the ball at the right hand as well as on the left, producing the sensation on the optic nerve of an oblate spheroid, giving false form, enfeebling my first impression, and destroying all unity of shadow, which for the sake of correctness is as important as the high light,—in short, producing an apparent prominence on the ball where there is really nothing of the kind.

Again, I erect a pole in the sunshine that casts a certain shadow on the ground. At a distance from the sun, say of 20°, an imaginary sun casts another shadow of the same pole. Neither of these shadows in the presence of the other will be so well formed—that is, so definite; each will appear abraded on the edges, and enfeebled by the presence of the other—the source of light in the one case tending to enfeeble the image of the other, and both combining to produce confusion of image on the optic nerve, the two sources of light being positively injurious to correct form.

Now, if we substitute the human figure in each of these cases, whatever happens to the ball and the pole in the matter of lighting happens to it under the given conditions. What conclusion ought I to come to, then, in regard to lighting? If two or more sources of light produce false effect, false form—protuberances where none exist in nature—unlikeness instead of likeness—feebleness of shadow—indefiniteness of shape—surely I ought to consider whether these false impressions cannot be removed by adopting *one source of light* in the construction of a portrait-room, and avoiding all opposing lights as utterly destructive of success, whether they be direct or reflected. *One source of light*, and one only, is the principle I venture to submit for your consideration; either with a high side light, which then becomes top and side, or else with the two combined in the same direction, never opposing.

Why is it so many photographic portraits are not likenesses? Because the principal light, which if left alone would make the portrait, is interfered with by reflection or opposing direction—false lights making prominences in the face where none exist in nature, or intensifying them where they do exist. I put out of the question here considered the ridiculous twaddle that is uttered by half-educated opticians, that prominences are magnified by the camera. In the infancy of our art this might have been the case—in the days of spectacle-lenses, and cigar-box cameras, and ignorance to direct them. But such men as Dallmeyer, Voigtlander, and Ross have done away with this incubus of the early photographer. These men have so balanced the curves of their lenses as to distribute the aberration equally over the field of view of the camera, and rendered distortion impossible within certain limits; and no intelligent operator would strain his lens to attempt to cover a larger field of view than that for which the lens was constructed. Photographers owe these able men a debt of gratitude for their splendid exertions: and while doing justice to them I am not unmindful that Petzval, l'Abbé Moigno, Foucault, and Grubb have each worked in the theoretical branch, and the two latter in the practical also, towards the same end.

Now, supposing I have made myself intelligible in the enunciation of the principle of *one source of light*, a glass room will grow out of a principle, and its form will be determined by the thing it has to do—that is, to produce perfect lighting of the figure, without distortion, confusion, or indecision. That it ought to have no more glass than is necessary to this end, I think will be evident to anyone capable of forming an opinion. An elongated glass room, all of glass, is really two sources of light—to say nothing of the heat and of the confusion to the camera-lens itself. This brings me to the point to project a glass house on the screen, from the principles here enunciated, guided by the experience of failure as well as of success.

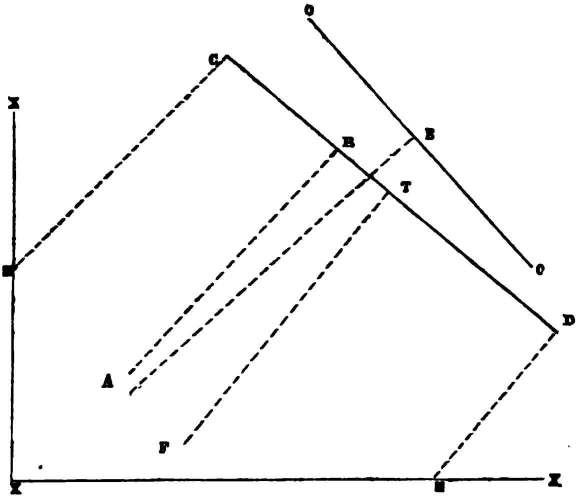
Let XXX be a section of your room, A the head of the sitter; a line AB to bisect another at B at right angles to BA will give you the pitch of the roof OO. For perfect illumination of the figure, I assume that the opening at B will be 7 feet on each side, or 14 feet altogether, which I find by experience about the best dimensions.

Now if the pitch of your roof be made flatter (CD), what part of your figure will be best illuminated?

Bisect your opening CD, and drop a perpendicular from T which strikes the figure at F; F is therefore the centre of illumination of the figure, and parallel lines from C and D to meet XXX embrace the area of illumination of the room CZ, DZ; but as this embraces too much foreground and too little background, it would be necessary to alter the centre T to a fresh point, R, so that the head shall be the centre of illumination. From this it clearly follows that the flatter the roof the more head-room will be required to preserve the centre of illumination on the head of the figure.

Now OO is at an angle of 45°, CD at an angle of 35°; therefore I conclude that from 35° to 45° is the best angle for the roof.

I lay it down as an axiom, high side-light for illumination of the subject, and controllable soft broken top-light to make the shadows —both combined, but in the same direction: no reflectors of any kind; these oppose the action of the principal light, and tend to enfeeble the likeness. In a short sentence, the *lighting* and the *shadowing* to come both from the same one *source of light*, blended, mixed, and broken in the same direction—not opposing, as all reflected lights do and ever will.



This brings me to the subject of blinds. I have tried various ones, M'Lachlan's included. I find light tissue paper of a blue colour very good to filter the sunlight through in summer, but too opaque in winter; muslin blinds of a grey tint are good, if made of two thicknesses and to slide over each other when the light is strong.

M'Lachlan's blinds were so badly made that they never had a fair chance in my hands. For breaking up the sunlight and massing it in its proper direction they are good, and, if simply mounted, very desirable, as they can be drawn up in winter out of the way when the sun does not shine. I now speak of them for top blinds for producing shadow, as I do not admit that the high lights can be produced with blinds at all. The side opening must be clear and of 14 feet, with blinds both white and black, to close, to open, or to modify the amount of light.

A painter's eye is necessary to judge of the various effects to be produced by different modifications of the quantity of light; but one thing must be borne in mind—that the scale of lighting must be higher than that which a painter would use, or else the resulting portrait will be dark in the shadows and with no brilliancy in the high lights.

According to my experience, the room ought to be 24 feet in length, a blank side wall from the background of 6 feet, then an open window 9 feet in width, by 12 or 14 feet in height. The width of the room 14 to 16 feet. The portion of the room in which the camera stands ought to be obscure; if in darkness, all the better, to prevent stray light impinging on the plate. For the side lights I recommend plate glass; for the top I am inclined to adopt this new light-coloured ribbed glass, which I think will dispense with blinds altogether.

The best aspect of a glass room is either north-east or south-west. I believe it will be found that north-east is better than any other, as the light is so steady and not so difficult to manage.

I have purposely made this paper short, that it might afford time for discussion; and I hope the Members will endeavour to grasp the principle I have endeavoured, however feebly, to enunciate, and that by combining our experience a better method of treating the light may ensue, and consequently greater perfection in the productions of our art.

The Chairman having invited a discussion of the paper:—

Mr. Allen said he quite agreed with the writer that in taking any solid object, such as the human figure, it was desirable that the principal light should come in one direction. But Mr. Mayall seemed to think it was essential that this light should pass at right angles from the roof of the glass house to the head of the sitter. When there was much diffused light he (Mr. Allen) believed that this was not absolutely necessary. He thought it ought to be borne in mind that, generally speaking, photographers had very little space upon which to erect a glass room, and that it would require a considerable area in order to carry out the suggestion of the writer. With reference to diffused light, he did not think it was altogether undesirable, and he remarked that landscapes were beautiful in the sun when every portion of the atmosphere was illuminated, but in the limited dimensions of a glass room there were shadows too strong for photography, though not too strong for the human eye. If they could have space enough to have a large glass room, they could afford to have a small amount of real light come upon the sitter.

Mr. **Hughes** said he would much rather have been a listener than a speaker on this occasion, as there were gentlemen present of great experience whose remarks it would have been a pleasure to hear, and he had himself recently said all he had to say upon this topic at the meeting of another Society. But having been called upon by the Chairman, he would offer one or two observations. The main idea enunciated in the paper just read—that it was desirable to have one principal broad light illuminating the sitter—was so true that it might almost be considered axiomatic, although in practice it was too frequently forgotten, or, for the sake of economy, was obliged to be disregarded. Still it was a principle, true in art and in every application, that there should be one dominant light giving form and shape to everything illuminated. In illustration of the fact, it was only necessary to throw two lights from opposite directions upon any given object, when it would be found that the apparent shape of that object was entirely altered. The example which had been already given of the effect of the arrangement of light upon a spherical body was a very familiar one, and it admirably illustrated the correctness of this position. A round ball, by a proper arrangement of light, could be so illuminated as to convey to the mind as real an impression of rotundity as though the ball were being held in the fingers. And so was it with the roundness of the head, the squareness of the cube, and the special form of any other object. Let two persons illuminate the same sphere, and mark the difference of result. One would so balance his lights that in the photographic representation it would appear literally to stand out in relief; whereas the other would so disarrange or derange his lights that, instead of the semblance of a sphere, it would be flat like a plate or disk. If one man could thus properly apply his lights so as to give an accurate delineation of a sphere, and another could so mismanage his lights as to destroy entirely the roundness of that object, what, he might ask, would the contrast between the works of these two persons be when they came to photograph the human head,,which so nearly approached the form of a sphere? The last speaker, he thought, had somewhat misunderstood Mr. Mayall's remarks upon the influence of diffused light, and supposed that he had spoken of it as desirable. But to prove the importance of having one governing dominant light and keeping all the other lights subordinate, let them take a view of a house with a north aspect in early morning, when equally illuminated with only a diffused light, and they would find that it scarcely looked like the house, whereas, if they waited till the sun came round upon it at an angle of 45° or thereabouts, illuminating this point, and throwing the other into shadow, the one dominant light (the sunlight) governing the whole, they would have not only a brilliant picture and a splendid specimen of photography, but also an accurate resemblance of that to which the camera was pointed. The undesirableness of general diffused light in photography was manifest in that greatest of glass houses, the Crystal Palace, where the light fell on the sitter, not in one but in every direction, and the consequence was a haziness which was in the highest degree unsatisfactory. When last in Paris he visited the immense photographic establishment beyond the Champs Elysées, and from all he had witnessed he was convinced that a small glass house was the most desirable. It was more manageable in the hands of the photographer, for the light was under complete control by the opening or closing of a blind here or there; but in a large room full of diffused light he would be always struggling to manage it and would never have the control of it thoroughly within reach. His advice, therefore, would be not to have more glass in the house than they could possibly help—to make the most of their local conditions, which generally speaking were the governing ones—and to secure as far as practicable one dominant light, all the others being secondary or subordinate.

Mr. **Allen** said he had never intended to convey the idea that he thought a large room full of diffused light was desirable, and that therefore it would be well to have glass all round. But he did think that the light which came from illuminated air tended to soften the shadows in photographic portraits.

Mr. **Fry** said there was one point upon which he should be glad to hear the experience of some gentlemen present. With regard to having the camera in a dark or light place there was some little diversity of opinion among photographers. He had had occasion recently to build a glass room, and he had adopted the plan of Mr. Stuart Wortley, with the glass slanting down from the front, and a dark part from that. It was found that, with reference to the first portion of the plan, it was a mistake, and it had to be altered; but he had still preserved the dark passage in which the camera stood, and he believed that a great advantage resulted from that form of building. In the first place he was freed from the inconvenience of using a focusing cloth; and in the next place, when there was any fog or vapour in the atmosphere he got less of it in that position, more especially as the part of the passage fronting the sitter could be further shut off by means of blinds.

Mr. **Cole**, referring to the remark made by Mr. Mayall as to the use of the new ribbed glass, said that he was not himself an operator, but he should imagine there would be a danger in employing it, from the refraction of light. He had with him what he considered a beautiful specimen of glass which would be very suitable for photographic rooms, as it enabled them to get a more equally diffused light than by employing ribbed glass. Ground glass, he thought, was detestable. Mr. Mayall was correctly understood in regard to the predominant principle to be observed in the construction of the glass house, but he had been misunderstood in saying that the light upon the sitter should be at right angles to the line of light; that was assuming a source of light at an infinite distance, and almost treating the skylight as a lens. Of course, he could not mean that there was no light upon the floor or on the background. He imagined that the use of side lights in portraiture was to lessen the intensity of the top lights; the brightest part of the sky he believed was that at an angle of 45°; and he remarked that, in his profession, he found he could get no compensation for loss of light below that angle.

Mr. B. Smith said he did not agree with Mr. Mayall that the absence of reflection was necessary or advantageous. He thought, on the contrary, that it was highly advantageous, and absolutely necessary, in order to produce roundness of effect, that they should have light, shade, and reflection.

Mr. Sebastian Davis did not consider it necessary that the light should pass directly through the glass at an angle of 45°, nor that it should be made to fall upon the sitter at that angle, although it might be desirable as being the average medium. Upon any other ground it would not be of any special service. The same reasoning would also show the utility of having the side light at a certain angle to the sitter.

Mr. Mayall, in reply, said, from the fact that he could not explain the whole of the diagram which he had drawn upon the board, he had been somewhat misunderstood. It was quite a misconception if it were supposed that he proposed to illuminate his figure with the sloping glass. His glass for illuminating the figure was his high side light, which was broken up and massed, but always in the same direction as the principal light. With reference to reflection, it was quite true that the painter could produce many beautiful effects by its aid; so could the photographer, but it sometimes led to distortion. It must be remembered that a photographic portrait was only one phase of a face; where they could use reflection, he maintained that they would produce a much finer effect with a direct light coming in the same direction as the principal light with which the sitter was illuminated. By having a large number of reflections in the glass house, it was possible they might make a very pretty picture; but it would be utterly unlike the person for whose portrait it was intended.

The Chairman said, in asking the Meeting to pass a vote of thanks to Mr. Mayall it was not necessary that he should make many remarks. When a gentleman like Mr. Mayall came forward to offer them the benefit of his experience during many years of observation and reflection, he felt confident they would cheerfully respond to the proposition in such a manner as would show their hearty appreciation of his great kindness.

The vote of thanks was carried by acclamation, and Mr. Mayall briefly acknowledged the same.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The usual Monthly Meeting of this Association was held at Myddelton Hall, Islington, on Wednesday, December 6th, W. W. King, Esq., in the Chair.

Mr. Barnett (Hon. Sec.) read the Minutes of the last Meeting, which were confirmed.

Mr. C. E. Elliott, of Jewin Street, was elected by ballot a Member of the Association.

Mr. H. Cooper, Jun., read the following paper:—

On Improvement in Photographic Processes and the Organico-Iron Developer.

Much has been said and written on the subject of photographers devoting too much of their attention to processes and formulæ, to the detriment of the artistic portion of their labours. That such is the case is doubtless true; but in trying to remedy it, we must be careful that we do not rush to the other extreme—cultivate art, and neglect manipulation. To produce a perfect photographic picture, art and science must go hand in hand with mechanical skill. As has oft been said, there is a proper medium in all things, to be found by careful and conscientious seekers. No one can be more anxious than myself to see art more cultivated amongst photographers. One proof of the necessity of art-education is the fact that nearly all, if not all the men whose works we so much admire have devoted their minds to art before the commencement of their photographic career. It is evident that no amount of teaching will make an artist where no natural ability exists; yet, at the same time, natural ability without culture is almost void and useless.

Whilst recognizing the immense and vital importance of the culture of art amongst us, we must bear in mind that instruments and processes are means to an end. And as adjuncts to the production of really artistic works, no one can be more desirous than I am of seeing our formulæ brought to the highest state of perfection.

In every art or science, in order to produce the best result, it is indispensable that the mechanical part be as near perfection as possible. It is an axiom, that, to produce a perfect whole, each part must be perfect. Let us take an instance from our great teacher, Nature.

The grand and magnificent landscape, that excites the liveliest emotion in those who are capable of appreciating its beauties, is a gigantic perfection made up of minute parts, each one in itself perfection. Every stone, every leaf, all the atoms that compose them are perfection. But are these parts themselves capable of producing great results? Decidedly not. It is in the arrangement of them that the stupendous effects that we are all more or less acquainted with are produced by nature.

Illustrations can also be taken from the kindred arts of painting and music. One from the latter will suffice for our present purpose. In the art of music it is necessary, in order to give due expression to beautiful, sublime, or lofty thoughts, that the instruments used be good, and that the musician be thoroughly experienced in the mechanical part of his art. In every profession, if the artist has not confidence in the materials used by him to produce a certain effect, the mind is diverted from the principal object. A violin-player cannot so wrap himself in the music he is interpreting as to give his whole mind to a proper translation of the beauties of the composer, if he is in constant trepidation lest at certain passages the strings or bow should give way, and so entirely destroy the effect.

To apply these remarks to photographers more especially, it is only needful to say that it must be obvious to all that the improvement of the means at our command, in all ways, conduces greatly to perfection of result.

When the mechanical and manipulatory portions of photography shall be brought to that state that failure in them shall be a thing of exception, and not the rule, then, and only then, can the mind of the photographer be entirely devoted to the proper conception of his picture. How is it possible that a man can give proper attention to artistic value in his productions, and, so to speak, imbue his picture with that spirit and evidence of soul in the artist, so vital in a really grand and beautiful work—how can he so express his own ideas that they shall be communicated to the minds of those looking upon his picture, when he is in a constant anxiety with regard to his chemicals, &c.? He does not know but what the effect of the most perfect arrangement may be marred by stains here, spots there, and other vexing and uncertain concomitants of the present state of our processes. Perfection can only be reached by the addition of little improvements; and it behoves us all to do our best and contribute towards the desired end, be it ever so small an advantage. I therefore think no apology needed for bringing again before you the subject of organic bodies in the developer.

That the addition of some form of gelatine to the protosulphate of iron developer has its uses and advantages is evident from the favourable verdict given by many whose names stand high in the profession. On the other hand, that many have found no advantage, or even, in some cases, a positive disadvantage, is extremely probable. This may have occurred either from mismanagement of the new developer, or from their chemicals working so well that a perfect result is obtained without adventitious aid, and without any after-doctoring. Gelatine in the developer is a power placed in our hands, which may be used for good or ill. Its use must be governed by discretion, as it is absurd to expect a person to make the best of a power which he does not know how to properly employ.

For some time I had been much troubled with thin grey images, requiring a great amount of forcing in the intensification before they could be made sufficiently dense for printing, thereby injuring the harmony of tone and gradation, and very often being the cause of vexing spots and stains making their unwelcome appearance just at the last moment. A negative in which the deposit is very minute in its particles, and whose intensity depends more on a non-actinic colour than on depth or quantity of deposit, must necessarily produce a picture more perfect as regards truth and harmony of gradation. The new developer has produced this desirable class of negative for me, as it has done for many others, and as I hope it will do for those who have not yet given it a trial.

Now comes the question as to the best method of preparing it—whether we shall adopt Carey Lea's difficult method, the very simple one of "Clericus," or Mr. Cherrill's. The first I shall discard from the question, on account of the numerous failures it is liable to in production, and because I do not see that it possesses any advantage over the more simple preparation first proposed by Mr. Cherrill. Between that and "Clericus" the choice is very easy when we come to understand a little their respective properties.

Very tedious experiments have been made to attempt to determine this, as also to see if any improvement could be made in their preparation. Before stating the conclusions that have been arrived at, it may be well to give a brief sketch of a few of the experiments made. Three drachms of gelatine were soaked in water, and, when soft, one ounce of pure sulphuric acid was poured upon it. After standing six hours, one ounce of water was added; and after again standing a short time, the solution was poured from the slight deposit present, and mixed with six times its bulk of methylated alcohol. It was now neutralized with ammonia, and it threw down a fine and delicate precipitate, which, after being washed in alcohol, was dried. The three drachms of gelatine and one ounce of sulphuric acid yielded about two ounces.

To form this compound sulphate of glycocine and ammonia, with which many experiments have been made, several methods have been employed; but it does not seem to make any difference whether the gelatine be dissolved in cold concentrated sulphuric acid, the same hot, cold or hot diluted acid, or whether the alcohol be added before neutralizing or after. Five grains of this complex sulphate of glycocine and ammonia added to a plain thirty-grain solution of sulphate of iron gave an excellent developer.

The sulphate is slightly deliquescent, and extremely soluble in water. It may be obtained in a state of greater purity by dissolving in water, and again precipitating by means of alcohol. The crystals are soluble to some extent in hot alcohol, and are deposited in a beautiful way on cooling. By boiling in water it is partially decomposed, and deposits a small quantity of the yellowish substance already referred to, which is soluble in fresh hot water, but not in cold; yet, if dissolved in hot water, it is held in solution when it becomes cold.

Two drachms of the sulphate were dissolved in two ounces of distilled water, filtered, and evaporated to one-half, at a moderate heat. The clear and colourless liquid was poured off, and the film of tough yellow substance adhering to the pan was dissolved in hot water, and added to it. It was rendered milky, and a flocculent precipitate was gradually formed, which was redissolved upon adding a little water, and the solution became perfectly clear

This appears to bear some analogy to the milkiness sometimes produced in my last formula, and to the precipitate formed by adding an excess of solution No. 2 in my first formula.

A portable organic developer can be made in several ways. I will mention two. The first is to precipitate the organic salt with alcohol, as just described, and keep it to dissolve in water, as required, with the sulphate of iron.

In the second the iron and organic salt are combined in one, either by crystallizing together a proper proportion of the precipitated salt used in method No. 1 with sulphate of iron, or by dissolving the sulphate of iron in the organic solution, without adding any alcohol. About six ounces of sulphate of iron should be dissolved in the solution containing three drachms of gelatine and one ounce of sulphuric acid. Other salts can of course be added, if any benefit is found from their use.

An experiment, the result of which I did not expect, was thus made:—Two drachms of gelatine were soaked in water, and dissolved in two drachms of sulphuric acid. After standing some time, it was neutralized with ammonia, and eight ounces of water added. This solution was tried in the developer; and such was its restraining power, that two drops in an ounce of a sixty-grain solution of sulphate of iron was sufficient to prevent fog; but the image was feeble and phantom-like, and, although the exposure had been a long one, there was a great lack of detail.

This, and other experiments in the same direction, show that we must not add too much gelatine to the sulphuric acid. I have found that three drachms of good strong gelatine to one ounce of concentrated acid is the maximum that can be satisfactorily employed. In some cases it will be as well to use only two or two-and-a-half drachms, as it is better to have too little than too much. The "sulphuro-gelatine" solution has been prepared in a multitude of ways, but none better has been found for general use than the one I last gave. It is not deemed necessary to tire you with the details of them; but should it be needful, they can be described during the discussion. I may here mention that, through the kindness of Mr. Bockett, I have been enabled to make a microscopic examination, under polarized light, &c., of the different organic salts prepared for experiment. What I wished to discover some clue to was, whether a definite chemical combination was formed between the sulphates of ammonia and glycocine and other unknown bodies present, and also whether the combination was altered in any material degree by variations in the mode of preparation. The subject of organic chemistry, particularly as applied to gelatine, is so hemmed in by doubts and difficulties on every side, that, although we have met with some curious and pleasing results, I am sorry to say that we have been unable to arrive at any very definite conclusion on the subject.

A few crystals of salts containing glycocine, &c., which have been used in different trials, I shall hand round for examination by those interested. I may also notice, in passing, that I have attempted to prepare a salt of glycocine in several ways by the action of *alkalies* on gelatine, but have not been very successful.

As this paper is already of a good length, I think it now time to say a few words on the two methods of preparing the organic solution—viz., that of "Clericus," and the one proposed by Mr. Cherrill. It appears to me, and I think my opinion will be borne out by those who have carefully worked the new developers, that gelatine simply dissolved in acetic acid and added to a solution of sulphate of iron acts almost entirely in a mechanical way, and is principally beneficial on account of the oily or glutinous properties it communicates to the developer. It also causes the silver that forms the image to be deposited in a slow and even manner, giving, moreover, a picture free from any tendency to fog. But when we have a salt of glycocine in the developer, the case is very different. The action is chemical in a high degree, and very slightly mechanical. It possesses the power of altering the density of the deposited silver and materially changing its colour. In the two formulæ given by me an attempt has been made to combine the valuable chemical effects of sulphate of glycocine and the mechanical ones of gelatine.

The nitrate of glycocine also gives great intensity; but the most powerful agent I have yet discovered is produced by dissolving gelatine in nitrosulphuric acid and neutralizing with ammonia.

I have tried several modifications of the "honey-developer;" but although I think it an improvement upon the ordinary, I am not so pleased with it as with either of those containing gelatine.

The addition of a little formic acid to the different organic developers has given me great satisfaction. I can fully endorse Mr. Jabez Hughes's suggestion as to the best mode of deriving the full benefit from the new developer. It is to have ready for use two solutions—one prepared either by Mr. Cherrill's formula or by some modification of it, and the other consisting simply of gelatine dissolved in acetic acid. If only a slight increase of intensity is desired on that already given by the chemicals with which we are working, we may use a little of the aceto-gelatine solution in our developer in the place of plain acetic acid. But if greater intensity is required, or if the image usually given is thin and grey, then we must use a developer containing either sulphate or nitrate of glycocine, or, more properly speaking, gelatine that has been fully acted upon by sulphuric or nitric acid.

I would recommend some chemist to prepare a crystallized sulphate of glycocine and ammonia, or potash, as it is a very convenient and portable form of the "sulphuro-gelatine" solution. The best preparation is that precipitated by alcohol. There is also little doubt of its possessing good keeping-qualities if placed in a well-corked bottle.

Some of my friends who have tried the new developer have complained that a longer exposure was required than when using the ordinary iron solution. This has, I believe, arisen from their having used too large a proportion of the organic solution. In some cases, particularly at this season, only a minute quantity is required.

My concluding recommendation is, Prepare ten ounces of a plain solution of sulphate of iron, say thirty grains, and add a few drops of organic solution. Try a plate. If after prolonged development there be any trace of fog, produced by abnormal reduction, add a little more of the organic solution until the right working-proportion is found. when I doubt not that benefit will be experienced from the use of gelatine in the developer, and a feeling of thankfulness to Mr. Carey Lea will arise for his valuable addition to our photographic formulæ.

The Chairman, in asking the Members to pass a vote of thanks to Mr. Cooper for his admirable paper, said that, although this Society was not one which had art in connexion with photography for its special object, it was one of a practical character, as the paper just read amply proved. It demonstrated how useless was anything connected with art without that practical work which must ever precede the theory of that art.

Mr. Cooper exhibited some beautiful specimens produced by the new organic developer, and expressed his regret that through ill health he had been prevented from printing several negatives which would have illustrated different points of interest. He hoped to be able to do so before the next Meeting.

Mr. J. Bockett read the following observations on the process.

Notes on the Ferro-gelatine Developer.

Since our Meeting held in October last, I have worked with ferrogelatine developers prepared according to Mr. Cooper's formula, and also the amended one mentioned in 'The British Journal of Photography.' Both gave good results, although slower in action than the ordinary protosulphate developer; but this was perfectly under control, according to the amount of extra protosulphate of iron added to the solutions. I find at this time of the year from 25 to 40 grains may be added. No alcohol was required to make the developer flow over the plate; and, as before stated, according to the proportion of iron added, so can the detail of the negative be quickly or slowly brought out. Any intensity can be obtained, provided sufficient exposure has been given.

In the course of my experiments some curious facts presented themselves, which, however, may be easily explained:—1. The plates, after development, washing, and fixing, took a very long time to dry—that to is say, spontaneously. 2. The plates may be much over-exposed, but still a decent negative can always be obtained. 3. It is almost impossible to fog a negative. 4. In copying engravings, old collodion, so contractile that the film with the ordinary iron developer always splits up, can, with the ferrogelatine developer, be used with the greatest advantage. I find also that such a film would not stand, in the case of an under-exposed negative, the addition of silver; but, strange to say, a plate prepared with the same collodion, and purposely under-exposed, bore intensification with pyro., citric acid, and silver, and even afterwards with bichloride of mercury and iodide of potassium, to such an extent that, although no half-tone existed, the deposit upon the plate fairly stands out in relief.

In my opinion one great thing should be avoided; I mean the addition of too much gelatine, its retarding action apparently being very great. Not only that; but if too much be added, the difficulty of getting it over large plates is increased, and the solution is apt to retain frothy bubbles.

Before closing these few remarks, I would say to those interested, that Mr. Cooper's solution yields some very beautiful crystals for the microscope, giving intense colour with the polariscope, assimilating to sections of hoof, &c. Although the crystals have been termed "glycocine," I believe that substance has not *per se* ever been isolated; and although as a show object it is calculated to rank among some of our finest polarizing crystals, I should be glad to hear from some gentleman present a better term for these compound crystals.

A vote of thanks was given to Mr. Bockett for his paper.

Mr. Cooper said he had been requested by Mr. Simpson to hand round some pictures by Mr. Jabez Hughes, which had been produced by one application of the new aceto-gelatine developer.

Mr. Foxlee said his experience with the developer was very limited, and the trials which he had made had not caused him to think so highly of it as many people did. He found that with a slow light, in which by the ordinary developer he could coach out a picture, he obtained with the new developer too much intensity before he got out the details of the picture. Mr. Hughes's formulæ for a strong light in summer and copying, he thought, as the result of his experiments, was invaluable; but in winter, when the picture required a great deal of forcing in the development, it was not so good as the other.

Mr. Cooper said, that was just where he had found the benefit of it, and he believed that in very weak light, and when great forcing was required, the new developer had special advantages. In support of this conviction, he stated that one of the pictures he had exhibited was taken on a wretchedly dark morning, and so unsatisfactory did it seem that he thought at first it hardly worth proceeding with. However, having resolved to try, he took some of the organic developer and added to it some plain solution of iron (60 grains to the ounce), and with that he forced the development. He then added a little silver, and continued the operation. The result was that he got a picture free from stain and not too intense.

Mr. Russell Manners Gordon, in reply to the Chairman, said he had merely used Mr. Hughes's modification of the developer, and so was hardly qualified to express a very decided opinion upon the subject. He thought Mr. Cherrill's formula was certainly the most valuable. In his (Mr. Gordon's) hands, Mr. Hughes's modification seemed to want double and treble the exposure that the ordinary iron-developer required; and even then, although it added slightly to the intensity, it hardly gave the same amount of detail.

Mr. Mackay said he had found that in dull light in London he got too much intensity and a coarse negative, but in a good light he could quite understand that it might be otherwise.

Mr. G. Allen said, having tried this developer, he was inclined to think the fault in reference to failures must be in the exposure. He believed that the question of the right time of exposure was of much greater importance than most persons engaged in photography attributed to it. As far as his experience went, it appeared that this developer, took rather longer than the ordinary developer, of 25 or 30 grains to the ounce.

Mr. Hart, on the subject of exposure, remarked that, on the previous Friday afternoon, the weather being very dull he had occasion to copy a few engravings, for which (being small pictures) he used a Ross's stereoscopic lens with ⅜ths stop. After an exposure of ten seconds, he developed with the formulæ given by Mr. Hughes at the last Meeting of the London Photographic Society—2 drachms of gelatine in 1 ounce of sulphuric acid neutralized with ammonia, and made up to a 20-ounce solution. He did not find that his pictures fogged, or that he got too great an intensity; on the contrary, he obtained a very nice printing-negative in that time.

Mr. Hooper had tried the aceto-gelatine developer with portraiture, and his difficulty was to get sufficient intensity. After having forced some copies considerably to gain sufficient intensity, he found the following morning that the plates, although varnished, were covered with spots, and the copies very much more intense.

After some further conversation,

Mr. W. Ackland read the following paper:—

On the Modified Fothergill Process.

Having been solicited to say a few words on my modification of the Fothergill process, I promised to do so; but the task is somewhat difficult after the very lucid descriptions given by the Editors of the two weekly Photographic Journals in their respective issues of the 20th October last, and the more so as the late fogs have totally prevented the continuance of experiments necessary to test its merits. I therefore defer making any remarks on the advantages gained until a more extended investigation shall enable me to speak with confidence backed up by repeated successful results, and, trusting that photographers generally will also test it for themselves, I now propose to say a few words on the solutions and manipulations employed.

The collodion best suited is certainly the bromo-iodized now so commonly issued by photographic chemists; and if it be newly iodized, it is a safe plan to add a sufficiency of tincture of iodine to give it a full sherry-colour. This does not appear to decrease sensitiveness, whilst any tendency to fogginess is prevented. The bromized collodion and alkaline development have been suggested, and very favourable results obtained by its use by Mr. Branfeld; but my trials with this collodion did not yield such success as I expected, possibly from my want of intimate knowledge concerning the developer employed. However, there is no difficulty in meeting with a suitable collodion, as samples from different makers which I have tried act very much alike. The only point to be attended to is to select one yielding a full creamy film when excited, and having no tendency to leave the plate in washing.

The exciting bath should be slightly acid, containing not less than thirty-five grains of nitrate of silver to the ounce, and may be conveniently made by dissolving an avoirdupois ounce of recrystallized nitrate of silver in two ounces of water, then adding about two drachms of the iodized collodion intended to be used, and after shaking well together to add ten ounces more water, and after another shake, and an hour or a night standing, to filter for use. A bath thus prepared will be found faintly acid and in excellent working-order without further trouble.

As prepared albumen may be preserved in good condition for years *if kept closely corked,* it saves trouble to prepare a considerable quantity at one time. To do this, carefully separate the yolk from the whites of any number of eggs, and to every eight ounces of albumen thus obtained add twenty drops of glacial acetic acid previously diluted with one ounce of water; stir these together with a glass rod until intimately mixed, which occupies about one minute; then, after resting one hour, strain through coarse muslin, and to the strained liquid add half a drachm of the strongest liquor ammoniæ; then preserve in carefully corked bottles.

Do not be induced to prepare the albumen for the dry process in the usual manner, as a viscid and often opalescent liquid is the result, whereas the above plan, besides occupying less time, yields an albumen very limpid, clear, and bright, and capable of being easily filtered through filtering paper to separate the slight sediment which forms by long keeping.

Six other solutions are necessary, to be prepared as follows:—

Solution A.	
Prepared albumen	½ ounce.
Strongest liquor ammoniæ ..	1 drachm.
Water	4 ounces.
Solution B.	
Nitrate of silver	8 grains.
Distilled water	4 ounces.
Dilute acetic acid.	
Glacial acetic acid	1 drachm.
Water	10 ounces.
Plain pyro. solution.	
Pyrogallic acid	100 grains.
Absolute alcohol	2 „
Acid pyro. solution.	
Pyrogallic acid	8 grains.
Citric acid	2 ounces.
Distilled water	4 „
Acid silver solution.	
Nitrate of silver	30 grains.
Citric acid	30 „
Distiled water..	1 ounce.

The solutions A and B are to be mixed in equal proportions for use; and *no more* should be mixed at a time than can be employed within twenty-four hours, as decomposition ensues, and foggy plates would be produced.

Having prepared all the above solutions and carefully filtered the bath solution, coat a well-cleaned glass plate with the selected collodion as usual; but allow it to "set" until the last drop at the corner of the plate from which the collodion was drained off is no longer liquid, but is capable of receiving the imprint of the skin of the thumb; then immerse in the bath for from three to five minutes according to the temperature of the room, and, after lifting in and out two or three times, take out and place on a tray filled with water, and agitate until the greasiness is removed from the surface; then allow it to rest whilst another plate is coated and placed in the exciting-bath. I may remark that distilled water is not required for any of the washings where water of an average quality like that supplied by the London water companies can be obtained. The plate having been allowed to soak for a couple of minutes or so, is now carefully washed by continued agitation and frequent changes of water for the space of another couple of minutes, and is then removed and flooded with a solution made by dissolving a tablespoonful of common salt in a quart of water. After this solution has remained on about half a minute, it is poured off, and the plate washed under a tap or by water gently poured on, so as to remove any of the salt-solution that may remain, and is then stood to drain with one of its corners touching the wall, and the other resting on a pad of clean blotting-paper. Here t is allowed to remain whilst a second plate is brought up to the same stage, which will occupy about five minutes; but the time is not very important, provided sufficient is allowed to drain off the excess of washing without any part becoming dry. Then pour over the surface, so as to avoid the formation of bubbles, a mixture made of equal parts of solutions A and B carefully filtered, and allow this to flow well up to each corner and then off into the sink. Pour on and off a second quantity of the same mixture three or four times; then stand up to drain as before described, until from six to a dozen plates are advanced thus far, taking care, of course, that the surface does not become dry. This prolonged draining is not necessary (five minutes is amply sufficient); but it is more convenient, and less liable to confuse, to prepare a number of plates up to albumenizing before proceeding to the next operation.

The plate, then, having been albumenized and drained, is now taken and either immersed in the dilute acetic acid, made as before directed, for a minute, or the acid may be poured on and off repeatedly for about that time. Again wash thoroughly for half a minute, then drain and dry, as usual; but avoid applying artificial heat.

My drying-box is a common packing-case of deal, about a foot square; this is laid on one of its sides, so that the hinges of the lid (which serves as a door) are upwards. In this, one dozen 7 × 16 plates can be dried in a night; but for larger-sized plates the size of the box must be proportionately increased.

The plates when drying are so placed that one of the upper corners just touches the box, whilst the lower and narrowest edge rests its whole extent on at least six thicknesses of clean blotting-paper.

Of course the plates are allowed to drain off the excess of washing-water before being placed in the drying-box; otherwise the interior would be so damp as to interfere materially with the rapidity of drying.

Nothing as to the keeping-qualities of plates thus prepared can as yet be said from actual experience; but, judging from inference, I should say that they may be depended on for at least twelve months.

The keeping-qualities *after* exposure and *before* development are also serious considerations; but I also here speak confidently from the fact that albumen, when once impressed by the actinic rays, seems to possess the power of retaining the latent image for a considerable time without loss, and is in this respect superior to either tannin or gelatine, as tannin is well known to retain the latent image only imperfectly, whilst gelatine rapidly parts with the impression, and requires development within twenty-four hours after exposure to secure good results.

The exposure required by these plates cannot as yet be strictly compared with that of other processes; but I incline to the belief that it is only half as long as for collodio-albumen or Fothergill plates; but this point can only be settled when we have the advantage of good light, and must therefore be deferred until the next spring.

We all know that the development of the latent image requires the exercise of the best skill and careful study; but we have such perfect control over this part of the process, that excellent results can be obtained even by the inexperienced.

To develope, moisten the surface of the plate with distilled water; then drop into the developing-glass (for a stereo. plate) ten drops of the plain pyro. solution, and drain the water on the plate into the glass containing the silver solution. Pour this over the plate two or three times, and allow it to rest until the high lights and sky are plainly visible. This will take about two minutes if properly exposed; but should any insufficiency of exposure have been given, those details may take a much longer time before being fully out. This primary development, however, must not be hastened by employing silver, but should be allowed whatever time it requires. Having secured all the high lights and the main details, even in the deep shades, throw off the pyrogallic solution, and, if still bright and colourless, add *one* drop of acid silver solution, and continue to pour on and off until the detail is brought out boldly. Should the pyrogallic solution have become coloured, a fresh quantity must be employed; and whenever silver is added to the developer the mixture must be kept constantly moving, as, if allowed to remain at rest, brain-like marbling in the sky and high lights will frequently follow.

The negative being now developed, so that all the detail is clearly shown (but of course without any vigour), requires intensifying, in order to give those contrasts so needed to yield a good proof. To do this, use about two drachms of the acid pyro solution to about ten to twenty drops of the acid silver solution, and pour this on the plate, and keep it constantly waving backwards and forwards until the required intensity is obtained.

During the development we can remedy an error of exposure. If too short a time has been given in the camera, prolong the action of the plain pyro. solution, and use a smaller quantity of acid silver solution in the intensifying; whereas we give an over-exposed plate but little time with the plain pyro., and use a full dose of acid silver in the intensifying.

The negative, after washing with water, is now fixed with hyposulphite of soda in the usual manner.

It only now remains for me to state that, since its first publication, I have seen nothing that would lead me to anticipate failures in this process under the ordinary advantages of good light; but the month just past has yielded but few gleams that would gladden the photographer, and has been adverse to extending a knowledge of the good or bad qualities of a process. Some of my correspondents distant from London November fogs write very cheeringly as to the success of their first attempt, none condemning or finding many difficulties in their way: and owing to the kindness of some two of those enterprising amateurs I am enabled to show you a few negatives of what this process will accomplish with a November light.

The Chairman, in moving a vote of thanks to Mr. Ackland, said it was no small honour for this Association to be able to say that a modification of this most important process had been made by one of their own members. This was a process which promised to be of the greatest service to photographers, especially to amateurs. With regard to the tannin process, he had found it work very badly, from its extreme uncertainty. It depended entirely upon the state of the collodion; and upon that they could very little rely. In reference to the keeping-qualities of plates prepared by this process, he mentioned that he had recently developed some pictures exposed about three weeks previously, and found that they had suffered no deterioration. He had to complain of the blurring, but that arose from the film not being sufficiently creamy. Mr. Ackland had spoken of the importance of attention to this point, and had advised that an acid bath should be used containing 35 grains of nitrate of silver to the ounce, and he (the Chairman) thought that might have something to do with state of the creaminess of the film. But, be that as it might, it was evident that the process with which albumen was connected, although it involved a considerable amount of manipulation, had retained a strong hold upon photographers in general. They must therefore regard it as a great advantage that a modification such as that under consideration had been brought forward. He trusted that the members of this Society would not fail to give weight to the paper just read, and that the result of further experience would be to make the process more nearly a perfect one.

Mr. Ackland said, one reason why on all occasions a stronger bath than usual should be employed was, that the proportion of iodide in the bromo-iodized collodion mostly sold in London contained nearer 6 grains than 4. If a bath containing 30 grains of nitrate of silver to the ounce was necessary for the 4-grain collodion, they ought to employ a bath of nearer 40 grains for the 6-grain collodion.

The Chairman said he had to bring under the attention of the Meeting a number of beautiful photographs taken by Mr. Frith by means of Ross's doublet—Views in Switzerland; a photograph by Mr. Ross himself of some Ferns, which was specially interesting; photographs of the roof of the Cloister of Canterbury Cathedral, and of Wells Cathedral, and of Barfreston doorway. All these had been forwarded for inspection by Mr. Ross, to whom he was sure the Association would gladly express their obligations.

Mr. Taylor exhibited some charming photographs by Mr. Anthony, of New York, upon porcelain paper, which were much admired.

Mr. Collis exhibited some frames for printing upon opal glass in various sizes.

Mr. Edmund Fox presented to the portfolio of the Association a photograph of the Old Mill on the Holme Wood near Dorking, and two views of Clapham Common.

The Chairman announced that the presentation prints of the Association would be ready by the January Meeting, and that any Member desiring to have his copy unmounted should signify the same to the Secretary.

The Meeting was then adjourned to Wednesday, January 3rd.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

It is with much regret we have to announce the death of Lieut.-Col. Bell, late Honorary Secretary of the Photographic Society of Scotland, in which office he succeeded Mr. T. B. Johnston in May last. Our readers must have missed from our columns during the last two months any notice of the proceedings of the Society to which Col. Bell was Secretary; this was due to the respect in which he was held by his fellow members, who declined to hold any meeting during his dangerous illness. In October last Col. Bell made a visit to London, and favoured us with a call; he was then apparently in excellent health, and the short intercourse we had with him impressed us with the belief that the Society had obtained a worthy successor to Mr. Johnston. That our readers may see how much the late Secretary of the Photographic Society of Scotland was respected by his fellow citizens, we extract the following from the 'Scotsman' of Dec. 4:—

"A large circle of friends will learn with much regret and sorrow of the death of this excellent gentleman, which took place yesterday at his residence here—the result of a prolonged attack of gastric or intermittent fever.

In a public capacity, Mr. Bell was chiefly prominent as a volunteer officer, having been for between two and three years past Colonel of the City of Edinburgh Artillery Volunteers. He held a captaincy in that corps at its original institution—the company he commanded being the second in the regiment, which now numbers nine companies. He was speedily promoted to be major; and when Mr. W. M. G. Macconochie Wellwood retired from the post of Lieutenant-Colonel, Major Bell was unanimously and cordially recommended by his brother officers for the appointment. Colonel Bell was most enthusiastic and indefatigable in the discharge of his duties as a volunteer, and studied and performed the work of an officer so efficiently as to call forth frequent and warm encomiums from the inspecting officers who from time to time examined the corps. He was very popular with the regiment, and took great pride in its efficiency, which he promoted not only by the enthusiasm of his example, and the energy and exactness with which he went through the drill, but by the presentation of several medals for superior excellence in company and gun drill. Colonel Bell has been cut off in the prime of manhood, being, we believe, between forty and fifty years of age, and leaves a widow and large family. He was the eldest son of Mr. Graham Bell of Crurie."

At a Meeting of the Council on the 11th inst., Mr. W. D. Clark, who is well known as an able landscape photographer, was elected as successor to Col. Bell; and the Society will now resume its former activity.

The Discovery of the Action of Light on Gelatine.

WE extract the following from a recent Number of the 'Moniteur de la Photographie;' but in doing so we must premise that we scarcely endorse the slighting observations on the general character of the 'Popular Science Review,' although they are fully merited in the photographic *résumé*, the blunders of which we recently pointed out:—

"Respecting the bichromates, the photographic journals have given us recently a sad xample of the pernicious influence of error in verything that concerns the sciences of obervation. It appears that the 'Popular Science Review,' which is edited by Dr. Lawon, seems to be no better informed on the ubject of photography than on science geneally. He has published a photographic article ull of all kinds of blunders, and, amongst thers, that of attributing to Mr. Fox Talbot he discovery of the action of light upon the bihromate, which discovery was made by Mr. Mungo Ponton in 1838, and which did not attract the attention of Mr. Talbot until 1852. However that may be, the Photographic Society's Journal has undertaken to expose these errors, and this has given rise to a fresh dispute relative to the discovery of the action of light upon bichromated gelatine. Finally, it rested upon the verdict of Mr. G. Wharton Simpson, the able editor of the 'Photographic News,' who, thus called upon to decide the question, gave in few words the dates."

We quote from the 'Photographic News' the historical data here referred to, which were given by the editor of that journal in answer to a correspondent, whose questions arose out of the notice of the matter in our October Number:—

"The records of the early history of photography are of a somewhat scattered character, but they are sufficiently complete to establish the question raised tolerably clearly. This cannot be done satisfactorily by an *ex cathedrâ* affirmation that one person did make the discovery, and another did not. In 1838 Mr. Mungo Ponton published his discovery that paper treated with a solution of bichromate of potash was sensitive to light, the effect of which was to darken the colour and render that colour insoluble, those parts protected from light remaining quite soluble. Mr. Robert Hunt, in stating the matter some years later, says Ponton discovered that well-sized paper was necessary. In 1840 M. Becquerel undertook a series of experiments to investigate the action of light on combinations of chromic acid and organic matter, and he ascertained that the action in Ponton's process was due to the combination of the bichromate and the size of the paper, which became insoluble under the action of light. Twelve years later, Mr. Fox Talbot, availing himself of the facts before discovered, mixed bichromate of potash and organic matter (gelatine being the organic matter employed) to obtain insolubility under the action of light as a necessary condition of an engraving process which he invented. This process he patented in 1852; and we are not aware that he published anything on the process earlier. Whether Mr. Ponton ever ascertained the theory upon which his discovery was based is not certain; but it was made tolerably clear in M. Becquerel's researches. Mr. Talbot has not, that we are aware of, ever made claim to his use of gelatine and bichromate as a discovery; but in any case it must be clear to every one that it is in no sense a discovery, but an application and further development of Ponton's discovery, which was further elucidated by Becquerel. For reference on these points we may mention Lerebour's 'Treatise on Photography,' 1843;

Hunt's 'Researches on Light' (1848, we believe); Hunt's 'Photography,' 1851; and the Patent Records, 1852."

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On Photography and the Phenakistoscope.

To the Editor of the Photographic Journal.

Sir,—On reading the article on "Stereoscopic Phenakistoscopy" in the 162nd Number of the Photographic Journal (which has but just been returned to me from Jamaica, where I lately resided), I have been reminded of an idea which occurred to me a considerable time back, on perusal of an article in a former Number of your Journal (the Number and date of which I have not at present the means of referring to) on the subject of "Photosculpture," or the then newly discovered art of producing solid, or moulded or sculptured representations (such as busts, statuettes, &c.), by the aid of several photographs taken from various points of view surrounding the object to be represented.

The results proposed to be attained by the ingenious contrivances of Mr. Claudet and of Mr. Mayhew, as detailed in the article first above referred to, however striking and interesting at first, can only be considered "scientific toys," the mere novelty and curiosity of which would scarcely be likely to secure for them any very permanent interest; for, as Mr. Mayhew observes, the range of *suitable* subjects for representation would be limited, and the trouble and *expense* of producing the necessary pictures would soon be found to be disproportionate to the value of the results,—such, for instance, as the representation of a gentleman continually bowing, or of a lady as perseveringly kissing her hand—illusions which are already obtainable at a much cheaper rate, and with sufficient accuracy and distinctness, by means of printing; it would, in short, I think, be found, after the first nine days' wonder and admiration, that "le jeu ne vaut pas la chandelle."

The result, however, which it occurred to me might be obtained by a somewhat different though similar combination of Photography and the Phenakistoscope, *was* the representation to the eye (or *eyes* if a stereoscopic arrangement could be adopted) of beautiful or interesting works of art, or of complex manufacture—such, for instance, as a statue, a bust, the Portland vase, a piece of machinery, an Armstrong gun with its carriage &c. complete, &c. (or possibly of a living subject), not merely as a plane (or even as a stereoscopic) representation of the original as seen from a single (or fixed double) point of view, but as though the object itself were made to revolve (more or less rapidly, at will) before the spectator, or as if the latter were to walk round the former, so that its several attributes of beauty, of interest, or of curiosity might be successively and more or less leisurely inspected and examined; and to produce this effect for every description of inanimate object, one camera alone would suffice, as all that would be requisite would be a pedestal, platform, or other suitable support for the object, so constructed as to admit of its being made to revolve upon a fixed centre, by which means the object could be presented to the stationary camera in as many different positions or points of view as it might be considered desirable to take pictures from; such points of view being equidistant upon an imaginary circle, of which a line drawn from the fixed centre of the revolving support to the camera would be the radius.

In the case of living models, it might be found necessary, or at least desirable, to take all the different pictures simultaneously, in which case a separate camera would, of course, be required for each point of view.

The several pictures, whether stereoscopic or single, thus obtained, on being properly arranged around the revolving disk with the unpronounceable name, or upon the horizontal paddle-wheel suggested by Mr. Mayhew, or, again, upon a polygonal drum or prism having a horizontal axis (so as to admit of each stereoscopic pair being placed side by side, when they could be viewed through the ordinary stereoscope slightly modified); and on the latter, whether disk, wheel, or drum, being made to revolve more or less rapidly, they would, I have no doubt, present to the eye or eyes a very perfect, pleasing and *useful* representation of the object itself as it would appear if made to revolve before the spectator.

It would, of course, be necessary to provide the means of shutting off the visual rays in the intervals between the presentation of each successive picture, as otherwise the image would appear confused and indistinct (as may be verified by looking into the mirror over the top of the ordinary revolving disk, (instead of through the narrow slits in the outer circumference); and to effect this in the case either of the paddle-wheel or of the polygonal drum, either an outer ring or cylinder revolving (horizontally in the former plan, or vertically in the latter) in connexion with the series of pictures, and having a narrow horizontal or perpendicular slit or opening opposite to each picture, should be provided; or the same effect could be obtained by a fixed screen being interposed between the eye or eyes and the picture to be viewed (whether single or stereoscopic)—such screen having a slit or opening opposite to each eye, and being provided with a sliding or otherwise moveable cover to each opening, and so arranged that, as each separate and succeeding picture should be brought opposite to the eye, such cover or stop would (by the motion of the disk, wheel or drum, or at least simultaneously with such motion) be removed for an instant and immediately replaced until the presentation of the next picture, and so on for the whole series of pictures. A very simple mechanism might be contrived, not only to turn the several pictures round with the desired velocity, and at the same time to effect the alternate opening and closing of the slits in the screen, but also to arrest the motion at any particular point of view, so as to enable the spectator to examine and to *study* the peculiar beauties or details of any particular view of the object.

I fear I may have been needlessly diffuse in the foregoing elucidation of my "idea" (an idea which may doubtless have also occurred to others among your numerous readers, though I have never *yet* seen it recorded), as the several arrangements I have detailed somewhat minutely, or some others equally or *more* simple and effective for attaining the desired object and results, would doubtless suggest themselves to any practical photographer (especially if he should *also* be a "Phenakistoscopian!").

I therefore crave your indulgence, and that of your readers, if I have unnecessarily or unprofitably trespassed on your space or their time and attention.

W. Antrobus Holwell.

6 Hill-terrace, Brook-hill,
Plumstead.

Photographing Foliage. By M. Carey Lea*.

Every one knows the difficulty of obtaining satisfactory detail in the shaded parts of dense foliage, and also how much this difficulty is ncreased where there are included in the view any highly actinic objects, which impress themselves too quickly upon the film to permit of giving an exposure as extended as the foliage would render advisable. It occurred to me, ome time since, that the interposition of *pale-green glass* would have the effect of stopping a part of the highly actinic rays, whilst it would have little effect upon the green rays coming from the foliage.

I was prevented from trying this experiment by two causes,—first, that no suitable pieces of glass came within my reach, fine plate glass being, of course, necessary, and neither too dark nor too light; and further, by this reflection, that much of the light that *does* reach us from foliage is pure white light, reflected from polished surfaces of leaves. Such white light is extremely precious, and gives, for example, the ivy the beautiful effect with which all photographers are so familiar. Now, this white light *would*, of course, be diminished by the interposition of the coloured glass, and therefore the general effect of such interposition, whether good or bad, could only be determined by careful experiment.

My attention has been brought back to this subject by a few lines which the 'Photographisches Archiv' for June copies from the Bavarian Kunst- und Gewerbeblatt. In this extract, Herr Michell, of Antwerp, states that by placing a *bright-blue glass* before the camera he has succeeded in obtaining from trees, grass, meadows, &c., a much truer and livelier effect.

Blue glass would seem to be less favourable than *very pale* green; for example, it would scarcely check the effect of the skies in solarizing themselves, and the same with white objects; and the brightest blue glass is that covered with cobalt, which stops a great many of the rays emitted by foliage, causing trees, grass, &c. to assume a dark grey colour.

If there be any truth in the general principle that the details of foliage are best brought out by the interposition of a blue or green glass, a curious consequence will follow—viz., that the best landscape effects will be obtainable with lenses that have a slight greenish colour and are not of the pure white colour which is generally so much preferred. Moreover it has lately been remarked (I think, by Mr. Bow) that a greenish colour in the glass adds to the uniformity of illumination; for the central pencils are obliged to pass through a greater thickness of glass than the marginal, and are merely weakened, thus bringing them nearer the strength of the marginal.

Should these considerations be verified by experiment, it would be not a little curious to find coloured objectives preferred to pure white for landscape effects.

On the other hand, there cannot be the least doubt that the slightest brownish colour, in a landscape lens or combination, must be a most serious fault, as tending most to weaken precisely that light which we are most anxious to preserve.

The consideration, however, which I mentioned at the outset, viz. the probability that a very large part of the effective light which comes to us from foliage is almost pure white light, sent back by the polished surface of leaves, must not be lost sight of in reasoning upon the effect of interposing more or less coloured media, and it is probable that it would be found to countervail, to a great extent, the benefit which this method would seem to promise.

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* From the 'American Journal of Photography.'

Photographing the Moon.

The light of the moon is so feeble that it will not produce an instantaneous photograph, but must continue to act for a considerable time on even the most sensitive collodion in order to create a perfect image. As any change in the relative position of the moon, the telescope, and the negative would blur and destroy the image, it is necessary to have the telescope so mounted and moved that its axis will continue to point precisely to the same portion of the moon during all the time of exposure; in other words, photographs of the moon can be taken by means of those telescopes only which are equatorially mounted. A revolving shaft is hung or suspended in a position precisely parallel to the surface of the earth—that is, pointing to the poles of the heavens—and the telescope is secured by a pivot to one side of this shaft. A gear wheel upon the end of the shaft is then connected with the works of a very accurate clock, which causes the shaft to rotate upon its axis once in twenty-four hours. Then, if the telescope is upon its pivot so as to point at the sun, as it is slowly revolved by the rotation of the shaft it will continue to point toward the sun during his whole circuit around the heavens. As the sun moves toward the east among the stars about one degree daily, to follow the track of any star the clock must be made to run a little faster; and as the moon sweeps along in the same direction daily some twelve degrees, to follow its course the telescope must be made to move a good deal slower. There are also some minor modifications in the motion of the telescope required to preserve its line of collimation in precisely the same position in relation to the moon.

The second step is to obtain a perfect focus of the actinic rays. When a sunbeam is bent from its course by refraction, the three elements of which it is composed are refracted in different degrees—the heat rays being refracted the least, the light rays next, and the chemical or actinic rays the most. Hence, if parallel rays of a sunbeam are concentrated by means of a convex lens, the focus of the actinic rays will be nearer the lens than the focus of the rays of light. To bring the focus into the proper position to produce a perfect image of the actinic rays, Mr. Rutherford ground a lens for his telescope for the special purpose of taking this photograph of the moon. He had a large telescope equatorially mounted, and he removed the object-glass, and commenced the laborious task of grinding one with his own hands adapted to the refrangibility of the actinic rays. This labour, frequently interrupted by the tedious process of testing, occupied about two years, and resulted in the production of this most perfect photograph of the moon ever taken.—*Scientific American.*

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The Society's Medals.—The Medals are finished, and will be distributed at the Anniversary Meeting. A few pounds are still required to clear the expenses, the dies having been executed from the voluntary contributions of Members. A list of subscribers will be published, previously to which the Secretary will feel thankful for any further contributions which any Member may feel disposed to contribute.

Royal Portraits.—A new portrait of the Queen has just been published by Mr. Mitchell of Bond Street. Her Majesty is represented in her widow's weeds, with the young Prince, Albert Victor, on her knee. We believe we are correct in stating that this is the first portrait of her Majesty which has been reproduced by engraving from a photograph; it will be not the less interesting to our readers that it is taken from an enlarged photograph produced by Mr. Jabez Hughes at Osborne; and we can vouch not only to its being an excellent engraving, but, what is better still, a very accurate copy of the photograph itself.

To the Editor of the Photographic Journal.

11th Nov. 1865.

Sir,—In your report of the last Meeting of the Photographic Society (Photographic Journal, 16th November 1865), I am represented to have said that statements had been made against me in the last Number of the Journal. What I said was, that I wished principally "to reply to charges that were made against me in the answer to my last letter to the Journal," or words to that effect.

C. Russell.

CORRESPONDENCE.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

We had intended to give a translation of an admirable letter which Mr. Claudet has recently addressed to one of the French journals in support of the claims of photography. Want of space compels us to postpone it to our next Number.

A notice of Dr. Fowler's work on Dry-Plate Photography must also stand over.

No. 165. JANUARY 16, 1866.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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PHOTOGRAPHIC SOCIETY.

The Anniversary Meeting of the Session will take place at King's College, on Tuesday, February 13th, at eight o'clock.

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„	March	13
„	April	10
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In another column will be found a report of a Special Meeting of the Society, convened in accordance with a resolution published in our last, to inquire into certain injurious misstatements published by Major Russell and Mr. G. Dawson, having reference to Mr. Glaisher as Vice-President of the Society. The Meeting was sparsely attended, and Mr. Dawson was present. To the latter circumstance was due the comparative abridgment of the proceedings; for when Mr. Glaisher had read but a small portion of the documents he was prepared to bring before the Meeting, a distinct issue arose, upon which it was proposed to ask Mr. Dawson some questions. It appeared, from some of the letters read, that Mr. Dawson had affirmed, in the hearing of several persons at the May Meeting of the Society, that he had in his possession a proof of Major Russell's paper read at that Meeting—a circumstance which, if true, would have been in violation of a recently passed stringent resolution of the Council. This statement, on coming to the ears of Major Russell, was pronounced to be utterly untrue, as Mr. Dawson had not been within thirty miles of him since the paper was written, nor had he or any one else even had a sight of the paper. This want of veracity somewhere, unimportant as the occasion may appear, was a part of a series of other similar misstatements, which, by exciting personal animosities, threatened to interfere seriously with the prosperity of the Society. When, therefore, the allusions to this circumstance arose in the course of reading the correspondence, a Member present proposed to ask Mr. Dawson if he really had such a proof in his possession. Mr. Dawson in reply said that he had not, that he must have been misunderstood, as he really only had a few headings on half a sheet of note paper as memoranda to assist him should he take part in any discussion which might arise.

The Secretary pointed out that this explanation scarcely met the discrepancy, inasmuch as Mr. Dawson had, at the time he spoke of having had the paper in his possession, promised not to publish it until after its appearance in the Society's Journal,—a promise that could not have had any relation to a few notes intended to aid him in discussion. Another statement made by Mr. Dawson, to the effect that the editor of another journal had also a proof in his possession, was met by a direct denial from the gentleman referred to. At this point of the proceedings, as will be seen from the report, various of the Members present indicated a wish not to press these discrepancies too heavily against Mr. Dawson. Mr. Shadbolt, as *amicus curiæ*, suggested that, as Mr. Dawson was clearly in error, he should apologize to Mr. Glaisher. This suggestion Mr. Dawson accepted, and, admitting having written under irritation and excitement, wished his statements to be considered as if they had not been made. Mr. Glaisher, not unwilling to adopt a lenient course, accepted this retractation and apology on behalf of the Society and all concerned. This done, sundry other resolutions followed, for details of which we refer our readers to the report.

It perhaps may be necessary to add that grave doubts are entertained by those who study the legality of public proceedings as to the right of a Special Meeting to entertain any proposition like the last resolution past, as being beyond the purpose for which it had been convened. In any case it is manifest that the only force it could possess is that of an invitation to the two Members concerned ot place themselves again in nomination for election in the usual way, which, as provided by Rule 9, consists in being duly balloted for at a General Meeting. We regret also to add that Mr. Dawson has since publicly denied his apology—a circumstance upon which we cannot comment. Mr. Glaisher has, however, as was manifestly due from him, met the statement in which he repudiates his apology with an indignant denial, characterizing it as utterly untrue. However unsatisfactory the general issue of Mr. Glaisher's efforts to bring these unpleasant matters to a pleasant termination, we presume that there is now nothing more to be done.

PHOTOGRAPHIC SOCIETY OF LONDON.

Special Meeting.

King's College, London.

Tuesday, December 19, 1865.

Dr. Wright in the Chair.

The Chairman—Gentlemen, this is a Special Meeting convened by direction of the Council, and in accordance with Rule No. 6 of the Society. That Rule the Secretary will now read.

The Secretary read Rule 6.

The Chairman—Gentlemen, the Secretary has received a letter from the Lord Chief Baron, the President of the Society, regretting his absence this evening.

I think we must all feel convinced that it was hardly to be expected his lordship could honour us with his presence when we think of the many urgent and important public duties he has to discharge. In fact it is something marvellous that he should be able to fulfil so efficiently as he does the whole of the duties which belong to his exalted position. It may well be said—

> "And still they looked, and still the wonder grew,
> That one small head should carry all he knew."

I will now call upon Mr. Glaisher to bring before you the special subject for consideration this evening.

Mr. Glaisher—Mr. Chairman and Gentlemen, it is well known that there is a Rule of the Society which provides that no paper shall be read nor any subject introduced at any of the meetings of the Members which has not been previously submitted to the Council. At a recent meeting it will be remembered that two gentlemen attempted to bring before the Society a matter which had *not* been laid before the Council, and, as my plain duty while occupying the chair was to preserve order, I could not allow those gentlemen to proceed in their intentions. The statements which they then wished to read have subsequently been published, and I now wish to read them to you. They are entitled

"The Rejected Addresses of the Photographic Society."

The Vice-President (Mr. Glaisher) then read these statements, together with the numerous letters which had passed between himself and Major Russell and Mr. Dawson, in the progress of which

Mr. Durham said, May I interrupt you for one moment. I find, by the first letter read, that Major Russell has resigned. I think, therefore, that in his absence we have no right whatever to discuss his conduct.

Mr. Glaisher—I am charged here with dishonourable proceedings, and I cannot stand before the Society without attempting to vindicate myself.

The Chairman—We must abide by the words of the resolution of the Council, under which this Special Meeting is convened, which has reference to a correspondence between Major Russell, Mr. Dawson, and Mr. Glaisher.

Mr. Sebastian Davis—The publication of the addresses has taken place since Major Russell's resignation; therefore these proceedings are quite regular.

Mr. Glaisher—With reference to the last part of Mr. Dawson's article, I may state that at the beginning of this year I did not know Mr. Dawson. On the 6th January Mr. Dawson introduced himself to me at Greenwich, stating, as a reason for so doing, his interest in the Society and his knowledge of the great interest which I took in it. He then told me (and it was the first time I ever knew that Mr. Simpson had anything to do with the Journal), that Mr. Simpson reported for the Journal, and he spoke of the injurious effect of that gentleman's connexion with it. He told me, also, there was a rumour that the Journal was about to cease, and that persons were going about trying to divert our advertisements.

Now, gentlemen, all the correspondence in January sprung from that visit to me by Mr. Dawson in the beginning of that month, and has no connexion whatever with that which occurred in May. At our Meeting on the 12th of May, Major Russell read a paper. On that night Mr. Dawson distinctly told me that he had a copy, or a proof, of that paper in his pocket. It had been stated a little time before that neither of the periodicals should have proofs of anything, but that it should appear first in our own Journal. I went to Dr. Diamond and asked how it was that Mr. Dawson had a proof of Major Russell's paper in his pocket; and the reply I received was, that he did not know. I then thought that the author had given him a proof; but in that I find I was mistaken, and did Major Russell so far an injustice.

Mr. Glaisher here read other correspondence which had passed, and stated, at a certain point, that he felt convinced that Mr. Dawson had not the proof which he stated he had.

Mr. Sebastian Davis—Mr. Chairman, I feel great regret at having to interrupt these proceedings; but as Mr. Dawson is present I should like to put a question to him through you.

Mr. Glaisher—May I not read this first?

Mr. Sebastian Davis—Oh, certainly.

Mr. Glaisher—I merely wish to include the letter which it has been publicly stated was marked private.

Mr. Glaisher then read a letter from Mr. Dawson, dated May 25, 1865, which is *not* marked private as stated by Mr. Dawson. A second letter of Mr. Dawson, dated May 25, making inquiries as to the fact of the letter of the 24th being marked private, and a letter of his own dated May 26, stating that the letter of May 24 was *not* marked private, and that, even if it had been, he could not as Vice-President receive such as a privileged communication, and also stating that he should bring the whole correspondence before the Council at the next meeting.

Mr. Sebastian Davis—The only reason I have for interrupting the proceedings of the evening is this. It appears to me, after having duly considered the subject with the Council, and having listened to the subsequent details contained in the correspondence, that we have already touched upon the vital point in connexion with these proceedings. Mr. Dawson, it seems, stated distinctly that he had a proof of Major Russell's paper in his pocket before it was read at the Meeting of this Society. Now, as a Member of the Society, seeing Mr. Dawson present, I think I may venture to put a question distinctly to him, as the Chairman (Mr. Glaisher) on a former occasion put a similar one to Mr. Simpson, viz. whether he had or had not a proof of that paper in his possession at the time referred to.

Mr. Dawson—I shall be most happy to answer the question. I have tried on two or three occasions to say that I had not a copy of the paper. I had two or three extracts from it—two or three of the divisions. I think the next letter of mine, if Mr. Glaisher will be kind enough to read it, will explain the matter.

Mr. Sebastian Davis—That is not quite to the purpose, to say you had an abstract of the paper. Was that abstract your own, or was it communicated by a Member of the Society?

Mr. Dawson—It was given me by Major Russell for my own information, upon my word of honour that I would make no use of it before the discussion arose.

Mr. Glaisher—I have a letter in which Major Russell says that Mr. Dawson had an abstract of the paper and another letter, in which he says he had a few notes only, mixed with other notes to guide him in case there should be a discussion.

Dr. Diamond—I beg to say that Mr. Dawson, in this room, standing there, observed to me that he had a proof of Major Russell's paper in his pocket; but he said, "I shall not use it before it appears in your Journal."

Mr. Robinson—I beg, also, to say that I heard Mr. Dawson say the same thing.

Mr. Dawson—I beg to say that I am prepared, before a Court of Justice, to say I never intended any one to understand anything of the sort. All I had was a short abstract, which was contained on half a sheet of note paper, and consisted of the heads of the subject of Major Russell's paper.

Mr. Sebastian Davis—The distinct impression communicated to the Council was, that, by some means or other, a communication had been made by some officer of the Society to Mr. Dawson, and that Mr. Dawson, in making the observation, certainly implied, as clearly as any matter could be understood, that he had a proof in his possession of Major Russell's paper, obtained from some officer of the Society.

Mr. Glaisher—I beg distinctly to state that Mr. Dawson, on that occasion, said he had a complete proof in his pocket. It was that statement which made me go to Dr. Diamond, and afterwards to tell Major Russell, when he said Mr. Dawson had told him Mr. Simpson had had a proof for days.

Mr. Johnson—I think you should bear in

mind that in a few days after that you had a distinct statement, in Mr. Dawson's own handwriting, to the effect that he did not say so. You have one disputed verbal account, and a distinct written statement by the person whose conduct is now in question before us.

Dr. **Diamond**—On the 27th of May, when I had little idea that the question would lead to all this discussion, I said to Major Russell, "There is a subject which I very much regret; it grieves me: Mr. Dawson has volunteered to me the observation that he had your paper (I think he used the words 'a proof of the Major's paper') in his pocket."

Mr. **Johnson**—You "think" he used the word?

Mr. **Robinson**—I am certain of it.

Dr. **Diamond**—I am borne out in the conviction that it was so from the fact that he added, "I shall not use it before the publication of your Journal." Now, if he had only a few notes, he could not have published it.

Mr. **Shadbolt**—I think there is some little misapprehension as to whether the word was "copy" or "proof." Mr. Dawson may have said he had a copy of the paper, meaning that he had the substance of it in abstract. From my knowledge of Mr. Glaisher and of Mr. Dawson, my conviction is very strong that neither of them would intentionally accuse the other of that which was wrong. I am sure that Mr. Glaisher is acting only in the interests of the Society; and I have already said to Mr. Dawson that I think he committed an error when he stated that his letters to Mr. Glaisher were only in reply. They are, it is true, in reply to certain things, but they go much beyond a reply in other things; and I think the article that was written, was written without at the time referring to the documents to see whether the statements were justifiable or not. Under these circumstances, I think, and I have told my friend so, that an apology is due to Mr. Glaisher for saying that the letters were written only in reply. Beyond that, I think Mr. Dawson has acted really and truly in all integrity, though, as he has made unpleasant charges against other people, he must bear the consequences.

Mr. **Johnson**—It is certainly untrue that his remarks were called for by a letter from Mr. Glaisher, but it is also certain that they were preceded by a letter from that gentleman with reference to the disputed point of the proof.

Mr. **Glaisher**—Before I read the letter which I hold in my hand, I would say that I have so much the interest of the Society at heart that I should be glad to be relieved from the necessity of going further into the correspondence. And to save that necessity, all I ask is, that Mr. Dawson should say I have not in the slightest degree acted dishonourably.

Mr. **Simpson**—There is one question I should wish first to ask Mr. Glaisher, if he will permit me.

Mr. **Glaisher**—Is it necessary?

Mr. **Simpson**—I think it is for myself. My name has been mentioned repeatedly in this correspondence, I will not say how impertinently; but there is one statement which I distinctly wish to understand. It is stated very broadly that I had received a slip or proof of Major Russell's paper, and that it had been in my possession a week before the abstract appeared in the Journal.

Mr. **Glaisher**—We know that the proof was not in existence a week before.

Mr. **Simpson**—But has not that assertion been made?

Mr. **Glaisher**—It has been made indirectly; but I think you had better not press the question.

Mr. **Simpson**—I merely wish it to be understood that that statement is utterly untrue, and has not a shadow of foundation.

Mr. **Hughes**—Is not that one of the grounds why Major Russell takes umbrage?

Mr. **Glaisher**—Undoubtedly it is.

Mr. **Johnson**—I think Mr. Dawson should tell us upon what grounds he made it.

Mr. **Dawson**—I appear here to-night from a sense of duty to myself, of duty to my friends, and of duty to those whom I oppose. I accept the position, and will say a few words. I never meant to accuse Mr. Glaisher of dishonourable conduct. I did feel annoyed, I must say, somehow or other, and I thought I had been treated unjustly by some persons, and I wrote that statement under considerable excitement. But I acquit Mr. Glaisher of all intention of being dishonourable, or of acting in any way but as a gentleman should do (loud applause). I should therefore wish that the statement I have made should be withdrawn, and no more thought about it.

Mr. **Greenwood** said, as one of the editors of the 'British Journal,' he was communicated with by Mr. Dawson, who, in his zeal for the interests of that publication, offered to supply him with a report of Major Russell's paper. Whether it was in the shape of an abstract or not, he (Mr. Greenwood) did not know. Notwithstanding the rule of the Society which had been referred to, he did not think there could be anything dishonourable in publishing such a report.

Mr. **Glaisher** said he was exceedingly glad that he stood before the Society free from those charges which had been brought against him, and he was delighted to think he was not bound to open up other matters.

Mr. **Simpson** said he did not consider that the statement he had before referred to, and which, as he then said was utterly untrue, had been sufficiently answered; it had rather been passed by. He wished it to be distinctly understood that he had had no proof and no copy of Major Russell's paper, and that no facilities were offered to him to make even a brief abstract of that paper on the occasion. He would also add that he remembered reading Mr. Taylor's abstract of that paper, which was much more lengthy than his own, and more complete.

Mr. **Mayall** said he thought the whole question resolved itself itself into a battle of editors ("No, no")—he did not say in relation to Mr. Glaisher, but in relation to the journals themselves. No doubt considerable misunderstanding had existed as to the precise meaning of two terms, and much intemperate writing had appeared; but every one who knew Mr. Glaisher would be unwilling to suppose that he was capable of acting in any way dishonourably. It was to be regretted that the 'British Journal' had inserted an article reflecting, as the one in question did, upon the character of a gentleman of Mr. Glaisher's scientific position, especially as the statements contained in it were not warranted by the facts of the case. He felt that the Council were quite justified in bringing the matter before the Society, and he trusted the result would be to put a stop to that unpleasant feeling which for a long time past had been rankling in the minds of some of the Members. The Society were under great obligations to Mr. Glaisher for the zeal and interest he had always manifested in its affairs, and he was sure that, in the subject now under consideration, they would entirely exonerate him from blame. He concluded by moving

> "That this Meeting, having heard the explanations of the Vice-President, Jas. Glaisher, Esq., on the subject of the charges of Major Russell and Mr. Dawson, relative to the possession of a copy of Major Russell's paper read at the meeting of this Society on the 12th May 1865,—resolved that this Meeting entirely exonerates Mr. Glaisher from all blame in the matter, and is of opinion that an apology is due to Mr. Glaisher from Mr. Dawson."

Mr. **Glaisher**—I have accepted an apology.

Mr. **Sebastian Davis** said he thought that they were all fully satisfied with the explanations that had been given; and inasmuch as the statement made by Mr. Dawson exonerated every officer of the Society from the charge of having furnished a proof of the paper in question to any one for the purpose of publication, he thought it would be better to adopt some such resolution as the following:—

> "That the best thanks of the Meeting be given to Mr. Glaisher for bringing the correspondence before them, and for the zeal and energy which he has uniformly shown in promoting the interests of the Society."

Mr. **Jabez Hughes** seconded this resolution, and in doing so said, he hoped that, henceforth, there would be an end of all those wranglings and of all those unpleasant insinuations which had, for a long time past, annoyed the readers of the 'Photographic Journal.' It was extremely painful to think that they could not examine the records of the progress of their own art and science without having continually and prominently brought before them that personal element, especially in the way of insinuation, which had occupied so much of their attention lately. He was glad that such a meeting as the present had been convened; and he thought that, in the explanations which had been given, they had got to the core of the matter. He hoped the conclusion at which the meeting might arrive would be satisfactory to all sides; and with reference to one gentleman—Mr. G. W. Simpson—he could not help saying that he thought no one had been so much abused as he had been in the course of this correspondence. His name had been constantly taken in vain; and he (Mr. Hughes) thought that the weakest point in Major Russell's position was that he seemed to have the idea that Mr. Simpson had some desperate intention to damage his reputation.

The motion was put to a show of hands, and carried unanimously amidst loud cheers.

Mr. **Glaisher** acknowledged the vote, and said that he had been throughout influenced by no personal motives. He rejoiced that the opportunity had been afforded for giving the explanations which had been offered, and he hoped that all unpleasant feeling would come to an end. Referring to Major Russell, he said he believed that a more honourable man did not exist; and when he told the meeting that he had that day received a letter from the Major in which he said, "I beg to assure you that I have no personal feeling against you," they would agree with him that there was no reason why the olive branch of peace should not be extended from one to the other. As to the Society, he believed there was a bright future before it if the members were but united and true to themselves; and in the prosperity of the Society, he felt assured, all the journals must participate. He thanked the meeting for the attention they had bestowed upon the subject he had brought under their attention, and for the resolution by which they had conveyed to him the expression of their continued confidence.

Mr. Thomas said, as an old member of the Society, he would ask the privilege of being allowed to move

> "That Major Russell and Mr. Dawson
> "be requested to withdraw their re-
> "signations."

Mr. Sebastian Davis seconded the motion, which, after some conversation, was put and carried.

Mr. Dawson said, before the meeting separated, he would request the Council, through the Chairman, to allow him to withdraw his resignation.

The Chairman said he was very happy to receive such an intimation.

The proceedings then terminated.

The following letter from Mr. Dawson, repudiating the apology he made at the Special Meeting of the Society, appeared in the 'Photographic News' of Dec. 29:—

"King's College, London, Dec. 27, 1865.

"Sir,—In the short account of the proceedings at the Special Meeting of the Photographic Society, published in the last number of the 'Photographic News,' you state that I apologized to Mr. Glaisher, and that my apology was accepted. This is an error, which I trust you will correct in your issue of this week.

"The real facts are these. I was prepared there and then to substantiate my published statement; but finding that the almost unanimous feeling of the meeting was opposed to the discussion of the personal question between Mr. Glaisher and myself on its merits, I, for the sake of peace and harmony, consented to waive discussion, and to withdraw my statement on the expressed understanding that the matter should here end.

"No apology was made on either side, and therefore none could have been accepted.

"I am, yours, &c.,

"George Dawson."

In the number of the same journal for January 5th appeared the following letters from Mr. Glaisher in reply to Mr. Dawson:—

Blackheath, December 27, 1865.

Sir,—I have just read some remarks on the Special Meeting of the Photographic Society, held on December 19, in your number for December 22, and I think it necessary that the facts which took place at that meeting should be clearly stated, more particularly as you use the word "compromise," a word implying mutual concessions.

The principal facts at the meeting were as follows:—First, I read, *in extenso*, the two articles which appeared in the 'British Journal of Photography' on November 24—one by Major Russell and the other by Mr. Dawson.

Secondly, in consequence of Mr. Dawson referring, in his article, to correspondence in January of this year, I stated that, on the 6th day of that month, Mr. Dawson introduced himself to me at Greenwich, and that all the correspondence to which he has made reference, in January, sprang from that visit, but which had no connexion with the correspondence beginning after the Photographic Society meeting in May.

I further stated that, on May 12, on the night Major Russell's paper was read, Mr. Dawson told me he knew the whole of Major Russell's paper; in fact he had a proof of it in his pocket. I next read four letters, the first dated May 17, from Major Russell, telling me that Mr. Simpson had made a better, though shorter, abstract of his paper than appeared in the 'British Journal of Photography" and that Mr. Dawson had told him that he might well do so, Mr. Simpson having had a proof in his possession for days, protesting very strongly against Mr. Simpson having this advantage, and dwelling upon the injurious effect upon the Society.

The second letter, a copy of my own in reply, assuring Major Russell that Mr. Simpson knew nothing of the paper till he heard it read, and I told him that Mr. Dawson had said that he had a copy of it himself on the night it was read.

The third letter was from Major Russell, dated May 19, who said that, with respect to Mr. Dawson having a proof of his paper, it was untrue; that Mr. Dawson, of his knowledge, had not been within thirty miles of him whilst he was writing it, that no one but myself had seen it, and that he should call Mr. Dawson to account for saying so.

The fourth letter was from Mr. Dawson, dated May 22, expressing a wish to see me personally, to explain about Major Russell's paper. To this I replied that I could not see Mr. Dawson at the time he mentioned, and I told him that Major Russell had told me that it was untrue in respect to his having a copy of the paper on the night it was read.

At this point I was interrupted, but proceeded to read three other letters, the first of which was from Mr. Dawson, dated May 24, *not marked private*, from which I have previously made extracts; another from Mr. Dawson, dated May 25, asking if the letter of the 24th was marked private; and one of mine, of the 26th, in reply, stating that the letter of the 24th was *not* marked private, and that, even if it had been, I could not, as Vice-President, receive such letters as private communications; that on its receipt I had at once placed myself, either by letter or personally, in communication with every officer of the Society, and that I should bring the whole correspondence under the notice of the Council of the Society, and take such further steps as might be deemed expedient.

Having read just so many letters as proved that in no case had I begun the correspondence, and in no case made public the contents of letters marked private; and pointed out that no letter, even if marked private, could be considered as privileged communications after I had absolutely declined to receive any as such, I allowed the interruption, which had been repeated, to take effect.

Mr. Davis then put the question to Mr. Dawson, as to whether he had a proof of Major Russell's letter in his possession on the night it was read.

Dr. Diamond said that Mr. Dawson had told him on the night that he had a proof in his possession; and Mr. Robinson said that he heard Mr. Dawson say he had a proof in his pocket.

Mr. Dawson said that he had not had a proof in his possession, and requested me to read an extract from another of his letters, dated May 29, in which he said that he had an abstract of the paper; and I stated that, in another letter, Mr. Dawson had said that he had a few notes only, mixed with other notes, to guide him if a discussion should take place.

Mr. Greenwood stated that he understood that Mr. Dawson, on that night, had an abstract of the paper in his possession.

Mr. Shadbolt then said that he had seen Mr. Dawson that afternoon, and looked over the correspondence, and had told Mr. Dawson that an apology was due to me.

Mr. Dawson said that he had written in excitement, and exceedingly regretted the past, he begged to withdraw all that he had written, that he did not intend to cast any reflexion on my honour, and tendered an apology.

This apology I, as Vice-President, at once accepted, and understood it to mean a clear retractation of all Mr. Dawson had said in relation to the Society, its officers, and Mr. Simpson, in his article of Nov. 24, 1865, in the 'British Journal of Photography,' and in his letters, which I had just read.

Having accepted the apology, I placed the whole correspondence in the hands of the Chairman, to be placed with the papers of the Society, considering that, as far as Mr. Dawson and the Society were concerned, the past was a bygone, and I hope you will consider it so also, and make no further reference to the Special Meeting, or to correspondence which preceded it.

I am, Sir, yours, &c.
James Glaisher.

[This letter, although written before the issue of our last, was not forwarded in time for publication. The following, as we have said, speaks for itself.]

Sir,—Page 617 of the 'Photographic News,' published December 29, 1865, has been sent to me, and I have read with surprise the letter of Mr. Dawson, dated "King's College, London, Dec. 27th, 1865," and regret to say that that gentleman still pesters me with letters, which, considering the result of the meeting at King's College, on Tuesday, December 19, I have neither the time nor inclination to answer. Furthermore I can state that the letter of December 27 is utterly untrue, and this must close all correspondence between Mr. Dawson and myself.—I am, sir, yours, &c., James Glaisher.

Blackheath, January 1, 1866.

PHOTOGRAPHIC SOCIETY OF LONDON.

Ordinary General Meeting.

King's College, London.
Tuesday, January 9, 1866.

J. Glaisher, Esq., F.R.S., V.P., in the Chair.

Dr. Wright read the Minutes of the last Ordinary Meeting, which were confirmed. The Minutes of the Special Meeting held on the 19th December were also read. On the motion that these Minutes be confirmed,

Mr. Jabez Hughes rose to ask whether, by the last resolution of the Special Meeting, Major Russell and Mr. Dawson were reinstated as Members of the Society.

The Chairman said the subject had not yet been officially before the Council.

Dr. Wright said the resolution simply went to the effect of requesting these gentlemen to withdraw their resignation, and after it was passed Mr. Dawson stated that he should ask the Council to allow him to do so.

Mr. Hughes said he only wanted to understand whether, upon that state of things, the Society regarded these gentlemen as *de facto* Members the same as before their resignation.

The Chairman did not think the matter could now be discussed. The only question before the Meeting was, whether the Minutes first read were a faithful record of the proceedings at the Special Meeting.

Mr. Hughes said, in that case he thought he was perfectly in order, because the Minutes distinctly stated that Mr. Dawson apologized, and Mr. Glaisher accepted his apology, whereas Mr. Dawson has since publicly stated that he made no apology on the occasion.

The Chairman said, whatever Mr. Dawson had since stated could not affect the only question now before the Meeting, which was whether the Minutes were correct.

Mr. Johnson said he desired to speak, upon the subject just referred to, before the resolution was put.

The Chairman declined to allow any discussion on the point, and put the question to the Meeting.

The confirmation of the Minutes was carried by 13 to 2 votes.

Mr. Edward Dunmore, of 81 Malden Road, Kentish Town, was elected by ballot a Member of the Society.

Mr. Hersch and Mr. H. Claudet, Jun., were appointed Auditors, this being the last Meeting prior to the Annual Meeting of the Society.

Mr. J. Hughes then read the following paper:—

Further observations on the Preparation of the Iron Developer so as to produce dense Negatives.

When I last had the honour of introducing this subject before the Society, time did not permit its discussion. I take for granted, however, that members are sufficiently familiar with it not to require the facts or formulæ to be re-stated. Continued personal experience confirms my conviction of the advantage gained by adding gelatine to the developer. I have, however, acquired broader and more general views as to its use, which on some future occasion I may have the opportunity of elaborating. I think for practical use the subject will be better understood if we bear in mind the twofold manner in which gelatine affects the developer—mechanically and chemically. Mechanically it causes the solution to be thicker and more viscous, so that it flows more easily over the plate, and more readily unites with the nitrate-of-silver solution in and on the film. Chemically it assists the acetic acid in checking the rapidly reducing power of the iron, so that the precipitated silver more perfectly represents the action of light. There are various ways of uniting the gelatine with the iron. Whichever way be used the solution will acquire the mechanical and chemical alteration; but some methods cause the change to be principally mechanical, and others cause it to be principally chemical.

When gelatine is acted on by dilute sulphuric acid, and the product neutralized as near as can be by protoxide of iron—Mr. Carey Lea's method—the chemical change is produced in an exalted degree. Also, when gelatine is acted on by dilute sulphuric acid, then neutralized by ammonia, and the resulting fluid added to a plain solution of protosulphate of iron—Mr. Cherrill's method—the chemical change is effected in proportion to the quantity added. When, however, gelatine is dissolved in dilute acetic acid—Clericus's method—and added to a plain solution of iron, then the change is much less chemical, and is more mechanical. When gelatine is dissolved by heat in water, and, without being acted on at all by acid, is added to the usual developer, then the change is least chemical and most mechanical. These variations embrace the whole range of the collo-iron developers, from the most difficult to prepare to the most simple from the strongly chemical to the simply mechanical. Of the two first, which I term chemical methods, I much prefer Mr. Cherrill's. It is easily, simply, and certainly prepared, and is capable of producing the faintest or the strongest effects, according to the quantity used. It is much superior to Mr. Lea's, which sadly lacks some of these desirable points. It is necessary this should be distinctly stated, as an advocate of Mr. Lea's method is doing serious injury to the subject by maintaining the contrary. Of the two methods of producing the mainly mechanical effects, I now prefer the adding of plain unacted-on gelatine to the usual developer, as being more simple and in its nature more universally applicable than the one known as Clericus's.

Our ideas will be clearer if we bear in mind the different action of the iron-salt, and gelatine. Protosulphate of iron it is that developes the picture; gelatine will *not* develope the picture. It checks, modifies, and retards development. The term "ferro-gelatine developer" is a misnomer; it is putting the *carte* behind the *visite*. "Gelatino-iron" or "collo-iron" is correct, because it is the iron and not the gelatine that develops, the latter only qualifies the manner of development. By using proper terms the subject is better understood; and photographic nomenclature is already too loose to permit us to be indifferent.

It is usually said that any kind of gelatine will do; I cannot answer for this; I rather doubt it. My own practice is chiefly confined to that known as Nelson's, and to it all my allusions refer.

Hitherto all the recommendations to use gelatine in the developer have been accompanied with certain formulæ of strengths of iron, &c. I have published different formulæ myself, and others have done so too. To those who have succeeded with these I recommend them to persevere. To those who have failed, I beg them to reconsider the matter, and to take a larger and more comprehensive view. Do not alter your present developers. Continue to prepare them as before, and merely add the gelatine as a modifying element. Each person works best with that strength of iron to which he is habituated. Let each add to his solution just as much or as little of the plain or modified gelatine as his necessities suggest. As a starting-point, let me ask any one of you, before you make any alteration, what are the results you now obtain? "Mr. A 1," for example, "tell me how does your developer behave? Do you get enough, or very nearly enough, intensity at once?" You answer, "Yes, I have no difficulty in getting sufficient density." "Very well, you have no need to come to gelatine for chemical help. Any addition of Mr. Cherrill's solution of 'sulphuro-gelatine' (as I have ventured to term it till its exact nature is settled) will only make your pictures hard and wiry, unless you give an increased exposure. Tell me, does your developer flow so uniformly that no markings or stains are caused by its acting too quickly?" You reply that you are not troubled with these now; you were in your early days, but you have got over all that. Then I say, "Mr.

A 1, you are a happy man. Don't add gelatine in any form to your developer; it will only disturb your exquisite working. 'They that be whole need not a physician.'" "Now, Mr. B, how does your developer behave?" You say your solution flows over right enough, but you rarely get enough density. You depend on pyro. and silver to intensify, and sometimes have to use a second dose. "I am happy to say there is help for you. Add a few drops—say, ten minims—of the sulphuro-gelatine to each ounce of your developer, and try its effect. If they do not cause density enough, try twenty, thirty, or more, until you get sufficient. Do not add too much, or you will rush from one evil to a greater:

> "'Tis excellent
> To have a giant's strength, but 'tis tyrannous
> To use it like a giant.'"

The next one, Mr. C, says he can always get density enough when the solution flows over properly, but it sometimes goes irregularly, leaving a mark occasionally in the corner, but frequently in the middle of the plate. To such a one the advice is, take advantage of the mechanically altered solution by adding, say, half a grain of gelatine to the developer. This will not materially increase the intensifying power, but it will considerably improve the flowing properties of the solution.

There is one more class of persons who have their troubles: their developer will flow irregularly, and will not yield intensity. These persons are recommended to the sulphuro-gelatine solution, and to add perhaps as much as thirty minims—more if necessary—to each ounce of the developer until the wished-for density is obtained. This quantity of the gelatinous solution will most probably have communicated all the proper flowing properties that are wished. If not, add a quarter or half a grain of plain gelatine to each ounce of developer.

In this homely manner, I suggest that everyone can draw what aid he requires, little or much, from the gelatine. No one knows where the shoe pinches like the wearer; no one knows how much or little a developer requires to improve it, but the user. What exactly suits me I know does not suit many of my friends. On the last occasion I gave formulæ, accompanied with suggestions for modification according to circumstances. This time I enlarge and prefer to give general principles; and, by attention to them, every person of intelligence can, without altering his acquired daily routine, derive all the advantages that flow from the use of gelatine in the developer.

After all, the most important organic element to mix the developer is "with brains, sir!"

Mr. Cooper read the following paper, on

The Organico-Iron Developers.

Having pledged myself to write a few words on the new developers as an addendum to Mr. Hughes' paper, I must redeem my promise; but I really have nothing new to say on the subject. Since the Meeting when the new developer was first brought before this Society, our experience with it has been considerably enlarged; I therefore hope that we are now qualified to form a moderately correct estimate of its advantages or disadvantages. As during the last few months I have written several papers on the new developers, I shall not trouble you with any details of manipulation or preparation, but content myself with referring you to the almanacs for this year of the 'Photographic News' and the 'British Journal of Photography' for the latest formulæ.

I, as you are aware, have been rather enthusiastic in my praise of the new developer; yet, although I have experienced such great benefit from its use, you must not suppose that I have been blind to the many drawbacks that it may possess, under certain circumstances. But its disadvantages seem to have been almost entirely felt by those who have no necessity to use it. It is claimed for it that it will enable you to get a rich non-actinic colour of deposit in your negative with great delicacy of gradation, when by the ordinary mode of working you could only get pictures thin and grey, which required a great deal of troublesome intensification. It stands to reason that if you already obtain negatives of sufficient richness and density, there is no occasion to use the new developer; in fact, instead of being beneficial, it will prove the reverse. This idea, which is based upon theoretical considerations, is amply borne out by practice. I could mention the names of several of our first photographers who have been much dissatisfied with the new developer; but, on the other hand, the number of those who have found the greatest benefit from it far outstrips them. It should be remembered that the first did not require it, the latter did; and I am pleased to think that all that has been said in its praise is substantiated by their experience. In my glass room, which is simply a conservatory, I have very little control over the light, and very often I could only obtain flat and feeble pictures. Since I have used the new developer my pictures have been very much better as regards modelling and gradation; and I can affirm with great confidence that this improvement is principally due to the use of gelatine in the developer.

I would especially recommend the new developer to those who are obliged to work in ill-arranged studios, in which, perhaps, there may be a large quantity of diffused light, which always tends more or less to produce a feeble, foggy picture. To those who can properly arrange their light, so that the resulting pictures are all that can be desired, I say, do not waste time by trying the gelatino-developer.

It is only of use to those who have failed to overcome, in other ways, difficulties that they may have experienced, such as foggy negatives, thin grey deposits, and stains or streaks *not proceeding from dirty plates*. It appears to me that the new developer will prove a great boon to the landscape-photographer, who is often obliged to work under very trying circumstances, both to negative and temper. The tendency to immunity from stains and fog, which the new preparation gives us, becomes more valuable than ever when we are working with a tent or developing-box, and when, either from heat or from its having been kept a long time after its removal from the bath, the plate has become partially dry.

In taking portraits of children it may prove valuable, as by using a very strong solution of iron, with enough organic solution to prevent fog, and a few minims of formic acid to each ounce of developer to give greater delicacy, the exposure may be very much shortened without materially deteriorating from the excellence of the finished picture. In concluding these very brief remarks, I would ask all those interested to give the new developer a fair, impartial, and unprejudiced trial, bearing in mind that its advantages or drawbacks will appear more or less according to circumstances, and that, therefore, the unsuccessful ones ought not to throw doubt upon the statements of the successful, nor, *vice versâ*, should those who have experienced benefit from it think that the non-success of others is always due to mismanagement or want of experience.

Mr. Cooper at the close of his paper handed round a few very fine pictures, nearly the whole of which he said were produced by one application of the new developer. One or two of them had been purposely under-exposed, and then forced in the development by using a little silver with a strong solution.

Mr. Nelson K. Cherrill read the following paper, on

The New Organic Iron Developer.

Gentlemen,—In coming before you this evening with a paper upon an interesting if not important subject, I feel myself placed in a somewhat difficult position, by the fact that you have already heard two very excellent communications upon the same subject.

It will be my endeavour to bring before you a few theoretical considerations in which I hope to show some analogy between the chemical effects produced by various developing-solutions, and to gather from them, though but imperfectly (owing to the difficulty of the subject), some idea as to the line of experiment which must be pursued in order to obtain that definite information which can alone lead us to suggest *real, important* modifications.

As a preliminary step, I must say a word or two upon the mechanical action of the developing-solution. Of course the first and most obvious advantage of a solution such as was first proposed by Mr. Hughes is, that, owing to its thick, viscous character, it is very easy to use; it flows well and evenly, and so avoids stains. But I venture to think that it has another. It is fair to suppose that the silver precipitated on the plate is *formed* in the solution in chemical atoms, and that these are only precipitated on the plate by first cohering into small lumps or grains (which may generally be seen in the microscope in a finished negative). Of course the *position* which these lumps or grains occupy on the plate is determined by that state of the latent image which causes the formation of the picture, and which, for the sake of convenience, I shall call chemical polarity.

It will now be easily seen that, if these atoms of silver are formed in a viscous solution, they will not cohere so readily, and will consequently fall to the plate much more slowly than if the solution were in simple water*. The grains thus falling in a state of finer division will render the deposit blacker; and by falling more slowly each grain will have more time to get into its proper place, and so the image will be more delicate. It may be remembered here, as analogous cases, that the more slowly any solution crystallize the more perfect will be the crystals, and that, if a very viscous solution is employed, the atoms *may* never cohere, and so, though formed, may remain in suspension as in Mr. W. Simpson's collodiochloride-of-silver printing-process.

I must now direct your attention to the chemical action of various substances which have been added to the developer. The first case will be that of using simply sulphate of iron and acetic acid to develope a plate containing a latent image and free nitrate of silver. The decomposition will be as follows.

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* May not this account for the objection which has been raised to the use of alcohol?

Iron has more affinity for oxygen than silver, therefore the iron in the sulphate will remove the oxygen from the nitrate of silver; and the nitric acid of the nitrate of silver being incapable of entering into chemical combination with pure silver, will go along with oxygen to form a per- or sesquisalt of iron. The reason for this is evident. The iron is already in combination with sulphuric acid and oxygen; it could not, therefore, take the oxygen from the nitrate of silver without taking the nitric acid at the same time, because protosulphate of iron + oxygen forms no chemical compound at all; but when it takes the nitric acid too (which exists in the nascent state and in exactly the right proportion), the sesquisulphate and sesquinitrate of iron will be found,

$$Fe_2O_3\,3SO_3 \text{ and } Fe_2O_3\,3NO_5.$$

This, which we may call the first decomposition, leaves free silver (in the nascent state), which would be precipitated over the plate all at once if it were not for the acetic acid. It is from the action of acetic acid in restraining the development, *i. e.* in preventing this sudden deposition of silver, that I wish to derive some idea of a theory which would account for the action of glycocine or other substances. Acetic acid is an organic compound, formed by the combination of 3 equivalents of oxygen with 3 of hydrogen and 4 of carbon, called for convenience acetyle (Ac). The formula for acetic acid is thus AcO_3+HO.

If we were to rob acetic acid of one equivalent of its oxygen, and so have the formula AcO_2+HO, we should have a new acid, called aldehydic acid. This new acid is *capable* of combining with oxide of silver, to form a compound called aldehydate of silver, $AgO\,AcO_2$.

This aldehydate of silver is capable of depositing silver in the metallic state under certain circumstances; when it does so, its decomposition is most simple: the one equivalent of oxygen combined with the silver goes to the aldehydic acid to form acetic acid, and so liberates the silver.

Seeing this, then, and knowing that the silver liberated in the first decomposition of the developer and nitrate on the plate was in the nascent state, and therefore in the best condition to effect decomposition, does it not seem that the most simple chemical decomposition and recomposition of the acetic acid, effected by this free silver, would account for the whole phenomenon of the restraining agency of acetic acid?

It may be briefly stated thus:—The nascent silver would seize on the oxygen of the acetic acid, thereby converting itself into oxide of silver, and the acetic acid into aldehydic acid. These two would combine to form aldehydate of silver, and this be decomposed into metallic silver and acetic acid, as the chemical polarity of the plate might direct.

We have thus seen a way in which, in perfect conformity with the rules which govern chemical decomposition, the phenomenon of development may be explained. I shall have further to submit to you some cases which would seem to point to a sort of general analogy existing between all the different substances employed.

Formic acid reduces the oxide of silver in a way somewhat resembling that of the acetic, the main difference being that in the one case the result is still acetic acid and silver, but in the other the acid is eventually decomposed. The decomposition in this case is sufficiently intelligible—

$$2AgO+C_2H_2O_4=2HO+2CO_2+2Ag.$$

Acetic aldehyde ($C_4H_4O_2$) is a substance known to reduce silver from its oxide, forming aldehydic acid, which would carry on decomposition as before mentioned.

Formic aldehyde ($C_2H_2O_2$), a very similar substance, might be thought to have much the same effect.

The composition of sugar of milk, which is a restraining agent used with great effect by M. Kaiser of Berlin, is $C_{12}H_{12}O_{12}$. This substance can easily be converted into two equivalents of lactic acid ($C_6H_6O_6$) (just one half the number of equivalents of each element); and lactic acid is generally regarded as *formic acid* coupled with *acetic aldehyde*. This is very simply shown in symbols:—

$$C_6H_6O_6=C_2H_2O_4+C_4H_4O_2.$$

From this we see that there is, or at least may be, some chemical analogy between development restrained by sugar of milk and that restrained by acetic acid.

We now come to the consideration of the analogy which exists between glycocine and acetic acid in development. I need scarcely inform you at this time that glycocine is formed by boiling gelatine in strong acids, and in other ways not yet applied photographically.

Before making any further remarks upon this substance, I must be permitted to withdraw a statement made some time ago, as not supported by any evidence, and as therefore likely to mislead others.

I said that if sulphate of glycocine with sulphuric acid in excess were neutralized with ammonia, we should most likely have a compound of sulphate of ammonia and sulphate of glycocine. But I am led to think that a powerful base like ammonia would decompose the sulphate of glycocine after having first neutralized all the sulphuric acid. The chemical formula for glycocine is $C_4\,NH_5\,O_4$.

I must now diverge again for a moment to introduce to your notice another compound homologous with glycocine. It is called alanine. Its composition is $C_6\,NH_7\,O_4$. This substance has not, as far as I know, made its appearance, by name at least, among the photographic chemicals, but it is so entirely similar to glycocine that I must use it in order to point out the present relation. Hyponitrous acid, NO_3, acting upon alanine, forms *lactic acid*,

$$C_6\,NH_7\,O_4+NO_3=HO+N_2+C_6\,H_6\,O_6\,;$$

and there is little doubt that hyponitrous acid acting upon glycocine in a similar manner forms glycolic acid,

$$C_4\,NH_5\,O_4+NO_3=HO+N_2+C_4\,H_4\,O_6.$$

It will be seen from this that glycolic acid bears exactly the same relations to glycocine as lactic acid does to alanine.

We have also seen that glycocine and alanine are entirely similar substances, and that alanine can be decomposed into lactic acid; it may, in fact, be considered an amide of that substance—that is, of formic acid and acetic aldehyde. Hence, by analogy, glycocine may be regarded as an amide of glycolic acid, that is, of formic acid and formic aldehyde. Thus we see also that glycocine, or glycolic acid, may act in a manner analogous to that of acetic acid.

There are two or three practical points which I wish to derive from these theoretical considerations:—

1st. That, owing to the ease with which glycocine, or the compound of it, gives off oxygen when under favourable circumstances, and also to the fact that acetic acid is sufficient to form with oxygen a persalt of iron, the developer will become saturated with a sesquisalt of iron in an unusually short space of time. To avoid this, the iron may be mixed with the organic substances without the addition of acetic or other acid. The acid may be added to a small quantity at a time, enough for a few days' use. The developer may thus be kept for any length of time.

2nd. That, owing to the fact that nitric acid (NO_5) soon forms hyponitrous acid (NO_3) when acting upon organic substances, and also that NO_3 will decompose glycocine into glycolic acid, it seems probable that nitric acid might afford a much better means of making the glycocine for photographic purposes: at least this method would be worth trying.

I have thus endeavoured to show you some points in which the new substance glycocine may be analogous in its actions to acetic acid. The reactions of complex organic substances are so various and complicated that it is difficult to speak with certainty about them. I hope that these suggestions of analogy may be worked out in time, and that from them we may derive some useful practical information. Suffice it now to remind you that true and valuable guides to practice can only be derived from a knowledge of principles, that the modifications of this developer which have been already suggested can only be tried theoretically by the light of increasing knowledge, or practically by their behaviour under the most difficult circumstances, and that in whatever way we study the various points which science brings before us, whether by empirical experiments or by analytical research, we must never lose sight of the truth (which comes before us hourly in these advancing days of the art) that "as yet we know nothing as we ought to know."

Mr. Cherrill added that he had not thought it necessary to illustrate a theoretical paper like this with any practical examples, but he might observe that a gentleman writing in one of the newspapers had asked whether it was possible to take clouds with the new developer. He had therefore taken one picture, which he now exhibited, and which, though it was not all that could be desired in respect to its quality, would give a sufficiently satisfactory answer to the question in the affirmative.

Mr. Allen said he had tried the new developer without obtaining the success he anticipated. He thought its flowing property was but a very small recommendation, as most photographers had surmounted the old difficulty in this respect. And in reference to its intensifying quality, his opinion was that they did not require to intensify a picture at all, for by so doing they destroyed much of its softness. The gelatine, he believed, acted only mechanically; its colour gave a colour to the image; and they could obtain that object better by using the ordinary developer three weeks old.

Mr. Fry regarded the application of gelatine as the greatest boon to photographers since the introduction of bromo-iodized collodion. At the beginning of its use he had a strong disbelief in its utility; and his first experiments were certainly failures. But with Mr. Hughes's formula he had been perfectly astonished at the results, and he was now only surprised that any operator should doubt its value, especially in the winter months. During eight months of the year he experienced no difficulty in producing full intensity and a finished effect with any negative, without silver or pyrogallic acid, but in weather like the present he could formerly only get poor thin negatives, such as London photographers were but too well acquainted with. He firmly believed that any person trying the process indicated by Mr. Hughes in its integrity could not fail to obtain an enormous advantage. He had that day been looking over some pictures taken this time last year and comparing them with others taken within the last month, and without exception he found that the difference in favour of the latter was most marked. The negatives of last year bore every trace of having had great pressure put upon them in order to get the full power developed, but those done upon the new process were summer negatives, having a bloom upon them like the side of a peach. He was struck by observing upon them the iridescent rays which he was only accustomed to see upon negatives taken in July and August. Many of these pictures were of large size (26 by 20), and there was not one out of at least twenty that had had any kind of intensification after the first development. He could not conceive it possible to attain such results by any other method, especially at this time of year. He had therefore good reason for saying that he regarded the invention as the greatest boon to photographers for a long time past.

Mr. **Debenham** said he thought the author of the first paper very properly classed the qualities of the gelatino-iron developer into the mechanical and the chemical. It was of the former he now wished to speak. The advantage claimed for it was, that it flowed more readily, which it certainly did. But in his hands it had been found, when tried simultaneously in the stereoscopic camera with the ordinary iron developer, to require a much longer exposure—so much longer as to present a serious objection to its use.

The **Chairman** inquired whether Mr. Debenham could give an idea of the proportionate extension of exposure required.

Mr. **Debenham** said he found it to be about as five to three. He also found that, if there was even a small amount of dust in the operating-room, particles got glued down to the plate, and made circles, very slight, but still sufficient to interfere with the effect. He thought it was not difficult to get a picture free from large stains with the ordinary developer, if a moderate amount of care were used. With regard to intensity, his impression was, that first-class photographs were never obtained without a slight addition of pyrogallic acid. The light half-tones were too much of a tone with the highest lights, and did not stand out with the same brilliancy.

Mr. **Buchanan Smith** said he understood that Mr. Cooper's pictures were taken with the iron developer only and the addition of gelatine, without any intensification; and they were certainly not wanting in brilliancy.

Mr. **Debenham** said he had seen them, and they were very nice and soft. They were intense enough, but they wanted a slight amount of brilliancy. The question of the time of exposure he thought was a very important one.

Mr. **Fry** said, upon that point he did not agree with the remark which had been made. He had tried the experiment in this way. He marked a plate of glass with a diamond, and took a picture with it. He then snapped the glass in two, and developed each portion in different ways. The result was to convince him that with the new developer no increase of exposure was necessary. If Mr. Debenham found it otherwise, he might rely upon it he had not the right preparation. And as to the difficulty spoken of as arising from dust, he could only recommend photographers to be careful and keep their operating-rooms free from any accumulation of it. He had seen so many charming pictures by Mr. Debenham, that he was quite at a loss to understand how his want of success with the new developer could have arisen.

Mr. **Debenham** said he had tried the same mode adopted by Mr. Fry, which was the only fair mode of determining the question of advantage on the score of exposure. He did not think a comparison ought to be drawn between pictures taken last winter and pictures taken recently, the weather in the two seasons being so different. He had tried, as he said, the developer upon pictures taken with a pair of twin lenses, and he could only suppose the different results he had realized must have arisen from the iron developer not being in the most favourable condition.

Mr. **Cherrill** suggested that those gentlemen who had found discrepancies in the time of exposure could not have arranged their restraining agents quite right. If too much glycocine were added to the solution, no doubt a longer exposure would be necessary. If the gelatine were not decomposed, the decomposition of the silver would be slower, and consequently there would be only a partially restraining effect. He had made a good many experiments, with the object of bringing out a formula for manufacturing glycocine or salt of glycocine, and also a salt of glycocine in combination with formic acid, in order to get the greatest possible advantage on the side of exposure. The result of his experience, using formic acid, was, that the necessary exposure was somewhat about half.

Mr. **Debenham** said he had not used glycocine at all, but gelatine, in the proportion of two-thirds of a grain to the ounce of developing-solution. He used twice as much sulphate of iron as when he used no gelatine, and half as much acetic acid.

Mr. **Cooper** inquired whether, in Mr. Debenham's practice, he usually obtained pictures that were moderately intense, or whether he obtained thin grey pictures.

Mr. **Debenham** said he preferred that a photograph should require a little intensifying with pyrogallic acid and silver. His pictures were not thin and grey, but slightly brown. If he got them sufficiently intense at once, he regarded it as a misfortune, for he found that he could not then obtain that brilliancy in the high lights of which he had spoken.

Mr. **Cooper** said the reason why he asked the question was this: he had usually found, when speaking to those of his friends who had tried the new developer, that in their experience, when they obtained moderate intensity, a longer exposure than ordinary was required; but in almost every case where persons had been troubled with thin, feeble, grey images, they found, upon becoming used to the new developer, that their negatives were better—that they got a rich non-actinic-coloured negative of moderate intensity without the necessity of a lengthened exposure.

Mr. **Allen** said, in an ordinary good light, and with the ordinary iron developer, he could obtain on the average six pictures out of every ten that did not require any after-intensification.

Mr. **Johnson** confessed that he now felt more mystified on the subject than when the discussion commenced, on account of the conflicting statements to which he had listened. He could not but think that much of the disagreement of opinion would have been avoided if they had started from some fixed point. He was surprised that neither in the papers nor throughout the course of the conversation any reference had been made to the nature of the collodion or to the bath. He had always understood that the properties of a developer were entirely relative. For instance, in the use of pyrogallic acid, every one knew they got totally different results, according to the nature of the collodion. In his opinion, therefore, they ought to begin such a discussion by fixing the nature of the collodion employed, and should also state what the condition of the bath was—whether a neutral or an acid bath was employed, whether acetic acid or nitric acid was used. Then they might be able to arrive at some definite notion as to the properties of the developer, otherwise the discussion was likely to be barren of any practical good. Referring to Mr. Hughes's paper, he said he thought that in passing by the formula of Mr. Carey Lea, they were taking a step backwards. Gelatine was not soluble except at a temperature above that of the atmosphere; and it was essential in all developers that they should find a modification which was soluble. With respect to Mr. Cherrill's paper, he could make no remarks. His statement was pure theory, without any experiments for a base, and the paper was, therefore, somewhat out of place in a meeting of practical photographers. ("No, no!")

The Chairman said it was highly important that they should observe theory as well as facts.

Mr. Johnson said he thought Mr. Cherrill had not given a single proof that nitrate of silver could produce any reducing action upon the acetic acid forming aldehyde.

The Chairman inquired what collodion Mr. Johnson used.

Mr. Johnson said he used a 30-grain bath very slightly acidified. In answer to a further question, he stated that he had used the same collodion as Mr. Fry used, with the differing results stated.

Mr. Debenham said he used a fully bromo-iodized collodion.

Mr. Cherrill said the whole of his experiments had been performed with a purely neutral bath. He kept it so by covering the bottom about half an inch deep with powdered marble. His bath had been in working order for three or four months. With reference to Mr. Johnson's remark, he might state that the whole of his facts were drawn from authentic chemical works.

Mr. Cooper said, during the time he had experimented with the new developer he had used four commercial samples of bromo-iodized collodion and three or four prepared by himself, and had not found any marked difference. With all he had realized a great advantage from the new developer; some gave a little more intensity. His bath was very slightly acidified with nitric acid. As to the difficulty arising from dust and the tendency of its presence to form spots, his experience justified him in saying that with the new developer, even when dust was present, he had invariably obtained cleaner pictures than in working with the old developer.

Mr. Oakley said the best form of developer he had been able to make was by dissolving gelatine in acetic acid mixed with a concentrated solution of sulphate of iron, and boiling it some little time, until the gelatine no longer gelatinized.

Mr. Hughes closed the discussion with a few observations in reply to some of the statements made, reiterating the remark made in his paper, that those photographers who obtained satisfactory results with the old developer, should be content to leave the use of the new one to those who, under less favourable circumstances, found the need of some such modification. In reference to Mr. Johnson's complaint that the nature of the collodion and the condition of the bath had not been alluded to, he remarked that he did not see the necessity for so doing, as his experience was based upon the use of the usual commercial bromo-iodized collodion. As to the condition of the bath, he believed that every operator worked with a bath as nearly neutral as possible; it was therefore not necessary to state that fact. One of the advantages of the developer was, that it was not hemmed in by any of these conditions, but permitted each to materially compensate for the deficiencies of the collodion and the nitrate bath, accordingly as it was used. He did not think any serious inconvenience would be likely to arise from the circumstance that the new developer, in some of its forms, had a tendency to gelatinize at a low temperature. When a solution containing one grain of gelatine to the ounce began to set, it was certain that the chemicals were altogether at too low a temperature for producing good work, and an excellent hint was thereby given to raise the temperature of the dark room so that not only the gelatine in the developer might be kept fluid, but that all the other things might be put into a better condition to work well.

The Chairman said it was his pleasing duty to propose a vote of thanks to the gentlemen who had favoured the Meeting with the suggestive papers that had been read. He had been pleased to hear the result of the experience of those who had taken part in the discussion; and though some of them had spoken of failures, he was not at all discouraged; for his views in reference to failures was, that they were frequently the steps to ultimate success, for it should be remembered that no success worth having was ever attained at one bound. On the question of temperature he remarked that for twenty years he worked at Greenwich in a room above ground, the temperature of which differed but little from that of the external atmosphere, and he found it necessary with every change of weather to vary the amount of his acetic acid and chemicals. About a year since he changed this room for one under ground, which was warmed by a stove, and was always maintained at nearly the same temperature. The result had been that his pictures in the winter were infinitely superior to those formerly obtained with all the care he could then bestow upon them. He was persuaded that, when the developer began to gelatinize, photographers might accept it as an indication that they had reached a point at which they could not work with advantage. In conclusion, he called attention to some beautiful prints on the table taken by Mr. Clark, the Secretary of the Edinburgh Photographic Society, by the collodio-albumen process, with Dallmeyer's new wide-angle lens.

The Meeting then adjourned.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

This Association held its usual Monthly Meeting at Myddelton Hall, Islington, on Wednesday, January 3rd. W. W. King, Esq., in the Chair.

Mr. Foxlee, in the absence of the Hon. Sec., read the Minutes of the last Meeting, which were confirmed.

The Chairman announced that the Presentation Plates of the Association were now ready for delivery to the Members.

On the motion of Mr. Hill, seconded by Mr. Goslett, thanks were voted to Mr. Frank Good, of Christchurch, Hants, for the loan of the negative of the print to be distributed; and on the motion of Mr. Foxlee, seconded by Mr. Robinson, thanks were also voted to Mr. England and Mr. Mudd for their kindness in supplying the Association with the photographs on such favourable terms.

Mr. Jex Collings, of No. 73 Princes Street, Leicester Square, was elected by ballot a Member of the Association.

Mr. F. W. Hart exhibited a new description of opal or transparency printing-frame, and gave the following information in reference to the object sought by the invention, and the mode of using it:—

On the Opal or Transparency Printing-Frame.

In placing my model for opal-glass-printing before you, I will, previously to illustrating its action, state the problems that had to be solved in its construction.

1. It is imperative that the negative shall be so held as to preclude the possibility of its falling away, *with the consequent risk of injury.*

2. It is necessary that the negative, when safely held as above, shall permit of any size of opal or other plate, smaller or larger, being brought into contact with any part of it. To make this plainer, you are aware that the image on the plate is not always in the centre, for many reasons. Again, 2, 3, 4, and 8 on a plate are in constant use in usual printing; it is desirable that any single one, even of the eight on a plate, should be adjustable to the centre of any small-sized opal plate.

3. That the opal or other plate, oval, square, or any other shape, be readily adjustable, and retained with firmness during the operation of printing.

4. That the apparatus shall ensure parallelism when used with glasses of any thickness, and shall retain it thus, to enable inspection to be made during printing.

I will now proceed to demonstrate the practical working of the apparatus before you. In the first place, we will select a plate with four *carte* negatives. It is desired to print from the lower right-hand corner picture. We place the entire plate in the < groove of the upper frame, which takes any size. It can, consequently, neither go forward nor backward, and thus the first and most important proposition of the problem is solved—*immunity from breakage.* The surface to print on is now laid under the part of the plate desired, and by means of the three clamps on the diagonal bed it is firmly fixed in its place. The registering-frame and screw-button are then fixed down. We now relieve the side screws, and the bed comes up and adjusts itself to the negative. The side screws are then tightened again, and the picture put in the light to print. The upper frame can of course be lifted as often as desired. By removing the screen at the back, its quality as a transparency can be judged of. In conclusion, as cabinet-making is not a speciality of my business, I shall be happy to afford camera-makers or others an opportunity (on application for appointment, by letter addressed to me at 52 Canterbury Road, London N.) to fully inspect the apparatus.

Mr. Simpson inquired whether there was any elasticity in the pressure.

Mr. Hart said there was. There were springs behind, by means of which perfect contact was secured.

Mr. Bockett thought the contrivance was an extremely ingenious one. He inquired whether Mr. Hart could give any idea of the probable cost of constructing the apparatus commercially.

Mr. Hart said he was not prepared to give an estimate of the cost.

Mr. Collis and other Members expressed themselves very much pleased with the invention.

A vote of thanks was accorded to Mr. Hart for bringing the apparatus under the notice of the Association, and for his kindness in offering to assist any one in constructing such a frame.

Mr. Taylor said he had been permitted by Mr. Swan, of Newcastle, to exhibit a new instantaneous shutter which that gentleman had invented. Mr. Swan had arrived in London that day, and, but for the circumstance of being very much fatigued, would have done himself the pleasure of attending the meeting. The ingenious apparatus which he had invented had for its object to effect an instantaneous exposure. It was put in the place of the ordinary diaphragm, and its action depended upon one spring pulling against another. It was so arranged as to be somewhat chronometric in character; *i. e.* the duration of exposure could be adjusted within certain limits.

Mr. **Swan**, at this period of the meeting, entered the room, and was very cordially received. He was invited by the Chairman to furnish the Association with some further information in reference to his invention. Having prefaced his remarks by expressing the satisfaction it afforded him to meet the Members of the Association, he said, It has long seemed to me to be a desideratum, when taking instantaneous photographs, to be able to vary the time of exposure. We all know that in taking ordinary photographs—not instantaneous ones—the quality of the result depends in a great measure upon the proper time of exposure; and in taking instantaneous pictures, I think that fact has been a little lost sight of. The exposure has been to a great extent a sort of hit or miss, and the obtaining of exactly the right exposure is too frequently a matter of accident. By means of this shutter I have tried to cut up into small fractions a second of time, in the same way as we cut up a minute by means of our watches. I have taken advantage of the law of falling bodies, *i. e.* the uniform rate at which bodies fall. By means of a small ball falling through a limited space, which space is adjustable, the shutter is raised and closed, and the duration of exposure varied accordingly. This shutter is intended to go in the tube of the lens in the place usually occupied by the diaphragm; and in this, I think, there is considerable advantage, because at that particular place the aperture is at the smallest, and of course the period occupied by the travelling of the shutter is reduced to a minimum, while the period during which the aperture of the lens is fully used is at its longest, by having the shutter to occupy that place. The sliding shutter is made of aluminium for the sake of lightness; and being put in the place of the diaphragm of an ordinary lens, it acts the part of the cap to stop the light. By pressing a trigger gently the cap will be raised, and on the instant, by the act of rising, the ball is disengaged and immediately commences its fall. The length of time during which the shutter remains up is the length of time occupied by the ball in coming to rest. In coming to rest it gives the cord a slight tug, and thus produces a second action in the shutter, causing it to close. The ball is not an essential part of the apparatus; it can be used without the ball, especially with ordinary photographs. In taking portraits, the attention of the sitter is rather apt to be diverted by the putting on and taking off the cap, and this inconvenience will, I think, be diminished by the use of this little apparatus. I ought to say that this shutter has been made by Mr. Cooke, of Newcastle, to whom I am indebted for the neatness with which my idea has been carried out, and for the general elaboration of the apparatus.

Mr. **Hill** inquired whether there was any arrangement for altering the size of the aperture.

Mr. **Swan** said there was; the ordinary diaphragm fitted into it, and the largest aperture in that corresponded to the full opening of the lens.

Mr. **Bockett** asked whether the construction of such a shutter would be expensive.

Mr. **Swan** said he thought it could be made at a moderate price, but at the present moment he was not able to state exactly what the cost would be.

Mr. **Taylor** said the apparatus could be made automatic by having a small piece of watch- or clock-work attached to it.

Mr. **Swan** said it could; but he did not think there was much value in that, because where the exposure was long it had to be adjusted by the variation of the light, and the necessary amount of exposure could not be anticipated.

The **Chairman**, in offering to Mr. Swan the cordial thanks of the Association for bringing this beautiful instrument before the Meeting, said he felt sure that the invention would be of great service to photographers by aiding them to attain more certainty in the time of exposure than had hitherto been practicable. This invention he was convinced would not be one of the least of Mr. Swan's solid contributions to the photographic art. The Association was much indebted to the circumstance which had made Mr. Swan their visitor on this occasion, and he trusted they might often have the pleasure of welcoming his presence at its meetings.

Mr. **Swan** acknowledged the vote, and expressed the satisfaction he felt in being able to make even so small a contribution to the progress of photography, in which they were all equally interested.

The **Chairman** announced that at the next Meeting Mr. Frank Haes would read a paper on Photographs of the Animals in the Zoological Gardens, as a sequel to the paper read last year before the Photographic Society of London.

The proceedings were then adjourned to Wednesday, February 7th, 1866, when the nomination of officers for the ensuing year would take place.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

First Meeting,

held in

The Society's Hall, 117 George Street.

The Rev. D. K. Drummond, Vice-President, in the Chair.

The Minutes of the preceding Meeting were approved.

It was proposed by the Chairman, and unanimously resolved, that a copy of the following Minute of the Council be sent by the Honourable Secretary to Mrs. Bell:—

"The Council cannot proceed to their ordinary business without recording in the Minutes their deep sense of the loss which the Photographic Society of Scotland has sustained in the death of their Secretary, Colonel Bell. All who knew him esteemed and respected him. His business habits, his devotion to photographic art, and his geniality of disposition and manner won the affectionate confidence of all, and made his appointment as Secretary an event of great promise for the future of the Photographic Society of Scotland. While the Council mourn over their loss of an esteemed friend and valuable coadjutor, they desire to express their heartfelt sympathy with her who has sustained a far greater loss, and would therefore convey to Mrs. Bell the assurance of the sentiments they cherish, and they earnestly trust and pray that the 'friend of the widow' may Himself bear her safe through this great and heavy trial."

At the suggestion of the Secretary the Rev. Chairman undertook to forward the Minute to Mrs. Bell.

Signor Antonio Montagna, of Mesagne, Italy, was elected a Corresponding Member of the Society.

A paper was read by Mr. R. D. Clark,

On the Wide-angle Lenses recently introduced by Mr. Dallmeyer and Mr. Ross, with illustrations.

At a Meeting of our Society in May last, a paper by Mr. Ross was read, in which he described his new wide-angle actinic doublet. On the same occasion I exhibited a few negatives taken with wide-angle lenses of various kinds.

The subject treated by Mr. Ross was to me a very interesting one; and impressed with the great beauty of the photographs of the Crystal Palace, by which the paper was illustrated, I suggested to our Secretary that it would be desirable to get some of these lenses for trial. Mr. Johnston wrote to Mr. Ross on the subject, who most kindly sent a 10 × 8 and a 12 × 10 lens. These were put into my hands. At my request Mr. Dallmeyer also sent a 10 × 8 and a 12 × 10 wide-angle lens in addition to the smaller one I already had. It is the results of my experiments with these lenses that I propose to lay before you to-night.

As the optical peculiarities of the lenses have been described by the makers, I need say nothing on that subject. In both, the stops are most conveniently arranged on a revolving disk, and, being fixed to the instrument, are always at hand, and no time is lost in changing them as in the old form. Mr. Ross's lens has in addition an internal shutter like an imperforated stop, this is an additional convenience, as it serves the purpose of a cap, which latter is sometimes not be found when it is wanted in the field. This shutter is intended to serve for a sun-shade as well.

Before I received the larger lenses, I made some experiments with Dallmeyer's No. 1 patented lens. Its equivalent focus is 7 inches. It has 5 stops; the largest is $\frac{1}{15}$th of its focal length, or ·46 of an inch, and its smallest $\frac{1}{35}$th of the focus, or ·199. It is stated to cover a a plate $7\frac{1}{4} \times 4\frac{1}{2}$ with the largest, and a plate 9 × 7 with the smallest stop. I used it with plates $8\frac{1}{2} \times 6\frac{1}{2}$, and generally with the stop $\frac{1}{30}$th of its focal length, or about a quarter of an inch.

I compared it with the No. 2 triplet of the same maker, by taking views in our city from the same points without moving the camera-stand. I produce these views, and you will see that, by a very rough estimate, it might be said that on this size of plate the new lens includes almost twice as much of the subject as the No. 2 triplet. That the lighting and the definition all over the plate is more satisfactory is shown by some views of Swiss scenery, by Mr. England, on the same size of plate as I tried. It seems to me that mountain-scenery has never been better rendered by photography than in some of these prints by Mr. England. Mr. George Wardley has also sent me a large collection of prints done by this same 7-inch focus lens. These are smaller in size than the others, $7\frac{1}{4} \times 4\frac{1}{2}$ plate. Mr. Wardley generally used a stop $\frac{1}{25}$th of the focal length, but one of his specimens is with the full aperture of the lens. These beautiful little prints by Mr. Wardley are all by the collodio-albumen process; they are remarkable both for delicacy and brilliancy, and show how little photographers know of dry-plate work who say it can only produce hard, black and white effects.

To test the rapidity of this lens, I tried four views of the same subject (St. Anthony's Chapel), on collodio-albumen plates, the exposure varying from twenty seconds up to five minutes, using the smallest stop; they all developed to fair negatives. A lens that gives a negative of a well-lighted subject on a plate 8½ × 6½ in twenty seconds and upwards, by a dry process, cannot be called a slow-working one.

Mr. Dallmeyer's 10 × 8 lens, or No. 3, has a focal length of 10 inches; and his 12 × 10, or No. 4, is 12 inches focus. I used both of these lenses, with plates 11¼ × 9¼, for some negatives taken at Inverary and at Tantalton Castle. I produce prints from these, and have marked on them the lens that was used and size of stop. You will see that the No. 3 lens of 10-inch focus covers the 11 × 9 plate with perfect definition up to the very edge, and could no doubt be used with a plate a size larger.

The result of these trials satisfied me that Mr. Dallmeyer's new lens accomplishes all that he said it would. The image on the ground glass is bright and sharp, and the light equally distributed over the plate. The angle included is a large one; and it can be used with stops of a moderate size.

I noticed that my photographic friends, in looking at the image on the ground glass for the first time, generally uttered an exclamation of surprise and delight at its beauty.

This lens was introduced as a landscape-lens only. I shall by-and-by refer to what can be done with it in architectural subjects.

Mr. Ross's lens was introduced specially for architectural subjects, landscapes, and copying. Mr. Ross has sent for exhibition a number of maps aud copies of engravings to show how admirably it works as a copying-lens. With regard to the copies of the engravings, he requests me to make an explanation which I am sure you will feel, with me, is quite unnecessary. It is regarding a very slight uneven edge on some of the prints: this arises from the old and soft paper of the original engravings not having been stretched whilst they were being copied. The copies of the maps will show that the lens gives lines absolutely straight. These copies are all of the most perfect kind.

The lens is produced in two forms, the "ordinary doublet" and the "wide-angle doublet." My experiments were made with two of the ordinary doublets—one for pictures 10 × 8, and another for 12 × 10.

The equivalent focus of the first named is 9 inches, and of the other 11¼ inches; so they are slightly shorter in focus than Dallmeyer's lenses for the same-sized plates. The stops are also smaller, the largest stop for the 10 × 8 lens being ·45, and the smallest ·175 of an inch, or about the $\frac{1}{20}$th and the $\frac{1}{50}$th of its focal length. For the 12 × 10 lens these stops are ·618 and ·2 respectively. Each lens has six stops.

This lens not only includes a very wide angle, but gives lines perfectly straight up to the very edge of the picture. This is shown by a number of beautiful photographs of architectural subjects sent by Mr. Ross for exhibition.

I took a view of the viaduct on the Tweed at Leaderfont with the 10 × 8 lens, using a plate 11¼ × 9¼. I levelled and focused the camera with the greatest care, and whilst doing so had a curious illustration of the accuracy of the lens. I was examining the plate all over with a magnifying-glass, looking out for any fault that might exist in the lens. I noticed near the margin of the plate one of the tall piers of the bridge was twisted in two places, and suspected the lens was not so perfect as it was said to be; but on looking up I found the distortion was not in the lens, but it was the pier itself that was twisted—a fact I had not noticed till I observed it on the ground glass. I think this photograph shows that this lens *does* include a very wide angle, combined with *perfectly* straight lines. A more distant view of the same bridge with a large group of trees satisfied me it could be used satisfactorily for simple landscape as well as for architecture.

I took four negatives of Melrose Abbey with Ross's lenses, intended as crucial examples. I selected Melrose for this purpose, as probably no building in Scotland has been more frequently photographed. I make bold to say that, from the best points of view, the *whole* building had never been included in one plate till these new wide-angle lenses were used.

When Mr. Dallmeyer sent me the first of his new lenses he wrote that I must remember it was chiefly intended for landscapes, and it would not do for architectural subjects much beyond the usual angle. On looking at the image produced by it of the buildings seen from my windows, it struck me that Dallmeyer scarcely did justice to his own production. I resolved to try it at Melrose also, and so went there with the intention of taking views with the same camera, from the same points of view, with the lenses of both makers. When there, Mr. Smith, of Darnich, kindly offered to assist me; and as he had also an 11 × 9 camera with a flange that suited Dallmeyer's 10-inch-focus new lens, we set to work. I used Ross's 9-inch and 11¼-inch lenses with collodio-albumen plates, and Mr. Smith used wet collodion with Dallmeyer's 10-inch lens.

We each took three views from the same points, prints of which I produce. Of course there will be a difference of development with two persons working according to difference of taste; but this will affect the light and shadow only, and so to some extent the general effect of the photograph; but that will not in any way affect the straightness of the lines, the lighting of the plate, the sharpness, or the amount of angle included.

The Members will judge for themselves how far the lenses have done their work satisfactorily. It will be observed that, when both the 10×8 lenses were used from the same point, Ross's includes a little more of the subject; but, on the other hand, its power is more nearly exhausted than Dallmeyer's. The latter lens would cover rather the larger plate. There is a marked difference in the lighting of the plate by the two lenses. In Ross's the brilliancy of the light falls off gradually from the centre to the margin. This necessitates the development being forced more at the side than the centre. This is probably more easily managed with wet collodion than with dry plates, such as I use.

These examples will probably illustrate fairly what class of architectural subjects may be taken by Dallmeyer's lens when the extreme angle is included. If in such circumstances there were vertical lines close to the margins of the picture the whole width of the picture, or nearly so, I would use Ross's lens rather than Dallmeyer's; but in all such cases I would prefer my old favourite the triplet, where it would include the subject, in preference to either of these new ones, simply because with the triplet such a large stop can be used with perfect definition.

So far as the stops are concerned, Dallmeyer's lens has the advantage, as will be seen by comparing the size of stops of the respective instruments, or the stops used as marked in the pictures I have shown you.

That pictures of the best quality can be produced by both of these new lenses is proved by the numerous examples I am able to lay before you taken by some of the best photographers in England. In the bound volumes you will find many fine pictures by Ross's lens, the production of F. Frith, W. G. Collings, and others.

The value of Mr. Ross's lens was shown by a large collection of photographs contributed by himself. They consisted of architectural and landscape subjects by Mr. F. Frith, Mr. W. G. Collings, and others,—also copies of of engravings and maps. That of Mr. Dallmeyer's lens by landscapes and architectural subjects by Mr. England and others, contributed by Mr. Dallmeyer; also by photographs by Mr. Smith of Melrose, Mr. Wardley and Mr. Sidebotham of Manchester.

Mr. Callaghan exhibited two large photographs by Professor Steinheil's new wide-angle lens, and large portraits by lenses constructed by Voigtländer & Son.

The Pantascopic Company exhibited a large collection of panoramic views of Swiss scenery by M. A. Braun of Darnoch, and views in the Lake District by Mr. Carlisle of Grasmere.

The various photographs were much admired; and a vote of thanks, proposed by Mr. Kinnear, to the gentlemen contributing them was unanimously carried.

The Chairman proposed a vote of thanks to Mr. Clark for his paper, and the Meeting adjourned.

Sarony's Posing-apparatus and Patent Rest.

After the camera and the lens, the head-rest is considered by all good portrait-photographers the most important instrument they employ; and upon the proper use of the rest much of the beauty of the picture depends. It has been stated by some that all attempts to steady the figure, which are brought about by the means of iron bars and supports, are a mistake, and are calculated to discompose the sitter, give an appearance of stiffness, and spoil the expression. That the reverse of this is nearer the truth is evident from the general use which is made of the awkward contrivances in the way of rests with which photographers have had hitherto to be content. Another mistaken notion amongst a small section of amateurs is, that a little movement in the figure during the exposure of the plate is an improvement rather than otherwise to the picture—that it produces a softness attainable by no other means, and gives a mystery to the outline which adds a charm and a poetry to the composition. In our opinion,t he most exquisite softness is quite compatible with extreme sharpness; and the only mystery we can discover in the confused outline produced by a figure that has been allowed to move is, how the producer of them should have had the courage to exhibit prints from which the first of photographic qualities—that of definition—had been eliminated.

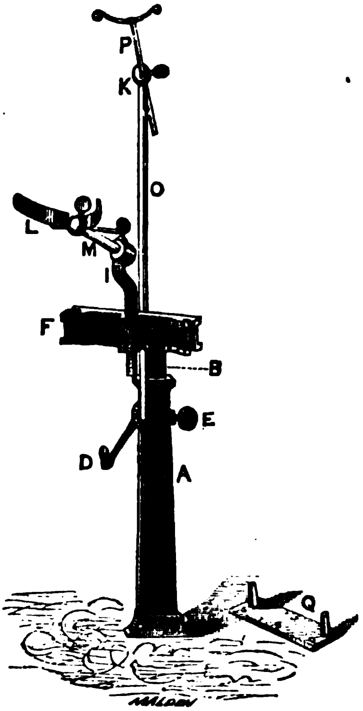
Definition, then, being necessary to a perfect photograph, the question is how to obtain that quality with the simplest means and with the least discomfort to the sitter. This can only be done by the aid of rests; for experience proves that it is impossible for the general run of sitters to remain sufficiently still in a standing position for more than two or three seconds, or sitting for a very short time longer. Besides, the effort to be still has sometimes such an effect on the muscles of the face, that a haggard, anxious look takes the place of the amiable and cheerful expression usually most desirable.

Another advantage of a good rest is, that portraits may be taken in dull weather, when, without such aid, anything like successful results would be impossible. Not that we think it advisable to attempt any kind of photography in a bad light; but it often happens to professional photographers that they are compelled to take portraits whatever state the light may be in, and however averse they may be to endangering their reputation by inferior work.

The contrivances invented to this end have hitherto been clumsy, inefficient, and difficult to use, producing weariness in the operator and irritation in the sitter, who often has the feeling of a victim, and in mercy should not be tortured more than it is possible to help.

Mr. Sarony, the inventor of the rest we are about to describe, although possibly not known to all our readers, perhaps from the distance he resides from town, and from his not sending pictures to our exhibitions, is one of the best portrait-photographers, and has probably the largest practice in England, his place in Scarborough, situated in the centre of the square, which is named, after the photographer, "Sarony Square," being, we believe, by far the greatest establishment devoted to photography, both as regards size and elegance, in this country. In his vast practice, this gentleman has felt the difficulties under which he has had to labour for the want of a really good support to the figure; and he set himself to work to design a rest which should combine the greatest number of advantages and the smallest amount of disadvantages possible; in this we feel convinced, from careful trial of it, he has succeeded to perfection. Moreover he has not only succeeded in offering to the photographer an efficient aid to steadiness, which is all that is usually expected of a rest, but he has also contrived to produce an apparatus which actually assists the artistic powers of the operator in a marked degree in producing graceful poses.

The apparatus, of which we give an illustration, consists of an iron pedestal or tube, A, into which a bar, B, to which the upper portion of the contrivance is attached, is inserted. This bar is worked with a rack and pinion, D, a much more convenient arrangement than the usual sliding bar fixed with a screw, and which is so apt to get out of order. The upper part of the moveable bar is surmounted by a sort of cap or cross head, F, in which all other parts of the apparatus work; there is a rest for the back, L M, which has a movement fitting it conveniently to the shape, quite new to mechanics. The head-rest, O P, somewhat resembles in form that usually employed, except that it has the great advantage of a lateral as well as a vertical movement, by which any alteration of the position of the figure or the body of the rest, within given limits, is avoided, and much greater grace in the figure can be secured. The part which comes in contact with the head is a great improvement on the old form. During the last year or two photographers have found great difficulty in making use of the common rest at all when taking the portraits of ladies, owing to the alteration in the fashion of wearing the hair. In Mr. Sarony's improvement he has surmounted this difficulty as well as the *chignon*, which was found to be so much in the way, by bending the forks, so that they may go over the hair and touch the head.



So much for that part of the apparatus necessary to steady the figure. But we find other contrivances of no less importance. Supplied with the rest is a stout flat bar of iron, not shown in the cut, which, when fixed in its place, F, forms a bent arm, to which the back of a chair can be attached and moved in any direction, or raised or lowered to suit any stature; the chair being attached to the rest has the advantage of being very firm and steady, entirely preventing the chance of the support running away, as it sometimes does, especially when the castors of the chair are large. A variety of accessories can also be used in the same manner.

This most useful and admirably contrived apparatus has many other advantages, which it is unnecessary for us to mention here. We believe it will be a great boon, not only to the photographer, but to the public for whose convenience it was invented. We would advise all photographers who have the opportunity to inspect this invention, which may be seen at Mr. James How's warehouse, 2 Foster Lane.

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Popular Science and Photography.

An angry contributor to the 'Popular Science Review' replies to our remarks in which, three months ago, we pointed out a series of singular blunders, in relation to photography, in the October number of that magazine. By way of proving himself right he ingeniously avoids all allusion to the majority of the palpable errors which were pointed out, and confines himself to one, in regard to which, by resorting to a quibble as to the meaning of the word discovery, he contrives to bewilder his readers by surrounding the subject with a labyrinth of words. Stript of extraneous matter and meaningless verbiage, his explanation consists in reasserting one error and ignoring all the others. He reasserts that Mr. Fox Talbot was the discoverer of the action of chromic salts on gelatine; and to prove this he states that "in no part of Mr. Ponton's paper of fourteen years previous is there the slightest allusion to any gelatinous substance." He altogether ignores the researches of M. Becquerel on the action of bichromates upon organic bodies in 1840. Possibly a writer so manifestly ignorant of his subject is not aware that gelatine is an organic body; possibly, also, he is not aware that it was the size in the paper which Mr. Ponton rendered insoluble by means of bichromate, and that this size consists mainly of gelatine. This writer further complains that in "gathering facts" (?) for his reply, he has "been subjected to some inconvenience and trouble," which he was "scarcely justified in submitting to." This admission probably explains the whole of the errors. We can readily understand that to one unfamiliar with his subject it was troublesome and inconvenient to gain information thereon; and we can also understand how it is that a writer unaccustomed to the exactitude necessary in scientific investigation shonld give, as an explanation, what is in reality nothing more than a reassertion of misstatements. Regarding the question in this light, we are disposed to look leniently upon blunders of incapacity; but we cannot resist asking the question why, with this acknowledged want of familiarity with the subject, this writer should meddle with it at all, much less assume an oracular tone in writing upon it. It is probably not worth while to make reference to other blunders in the last number of the same journal. Seeing that we have once pointed out the untrustworthiness of one who has assumed to be an authority, our readers will not be likely to be misled by his future errors.

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Photography as an Art. By A. Claudet, Esq.

M. Claudet has recently addressed the following able letter to the 'Gazette des Beaux Arts,' in answer to some disparaging remarks on the position and character of photography:—

Monsieur,—In the October number of the 'Gazette des Beaux Arts' I read these words —*la photographie, la bête et vile photographie.*" It is in these strange terms that the author of an article entitled "De quelques arts qui s'en vont" introduces the subject.

If, with the object of gratuitously disparaging photography, we were to seek expressions more singularly inappropriate and remarkably false, it would be difficult to find others which could be applied with less justice and reason than those I have quoted.

According to the dictionary, *bête* signifies *silly, stupid*; and *vil* signifies *low, abject, despicable.* Under which point of view, may I venture to ask, is it right to apply to photography such injurious and disgusting qualications?

What! One of the most beautiful discoveries of the age, which, amid the applause of all Europe, scientific and artistic, was honoured with a national recompense—a discovery founded upon the combination of the most extraordinary principles of the physical sciences, and producing the most perfect results, and exquisitely charming (in spite of the numerous exceptions which prove the rule)—does not this brilliant discovery deserve, from the pen of a pure and brilliant writer in the 'Gazette des Beaux Arts,' some other qualification than *bête* and *vile*? I regret it extremely, because I am one of those who understand photography, admire it, and foresee its future, and who also comprehend the useful influence it must exercise upon the Fine Arts, especially in their connexion with manufactures.

But photography has been judged a long time ago: at its birth the illustrious Delaroche, in a note addressed to the no less illustrious Arago, when charged with making a report from the "Académie des Sciences" to the Chamber of Deputies upon the great merit and immense value of the invention of photography—Delaroche's words were, "*The beautiful discovery of Daguerre is an immense service rendered to the arts.*"

We cannot fail to recognize that there *are arts which die out,* and that it is photography which has struck them with death. Why are there no miniature-painters now? For the very simple reason that those who want miniatures find that photographs are better, and that, instead of portraits more or less incorrect with respect to drawing and character, photography produces perfectly exact likenesses, which at least gladden the heart and satisfy the memory.

Why have we fewer engravings and lithographs? For the reason that photography gives us more perfect representations of all the creations of genius, and in less time and at less expense than the old methods. The arts which died out were themselves, after all, neither *bêtes* nor *vils*; and can we apply these terms to the art (*mechanical,* if you please) which replaces them for the simple reason that its results are better than theirs? What is there, then, so *stupid* and *vile* in this triumph, easy though it may be?

Printing also killed more than one art, and the most to be regretted is calligraphy.

Printing is even more mechanical than photography; yet, for all that, who would think of calling it *stupid* and *vile,* though, like the machine in its rapid course upon the road of progress, it overthrows and destroys an excellent art which can never be replaced? Photography has many features of resemblance with printing, and, like its senior, it is called to exercise a great influence upon everything which concerns the arts and sciences, and, like it, to contribute to the development of taste, intelligence, and instruction.

Shall we call the railway a *stupid* and *vile* invention, because it has destroyed the "diligence," which carried us very slowly, it is true, but much more poetically? We traversed mountains and valleys, amid picturesque scenery, with time to admire the most varied sites. What varied sensations did we not experience while passing near the straw-thatched hamlet or through the quiet village, and, at twilight, entering slowly over the drawbridge and through the studded gate of the fortified city, surrounded with ruinous walls and empty moats! Of all this there remains only the remembrance, which does not justify the epithets *stupid* and *vile* being applied to another and more useful order of things.

And the courier—that agile and interesting being who formerly conveyed our hurried messages—should we not be equally justified in applying as coarse an epithet to the metallic wire which has destroyed his occupation, and which in invisible waves through solid matter transmits thought to any distance with the rapidity of lightning?

All that civilization has painfully accomplished, all that the labour of man has with painful effort drawn from the depths of science—in a word, everything which constitutes a triumph of genius deserves admiration and respect, especially of writers who accept the mission of directing public judgment in all questions of art and progress, and of spreading the knowledge which must form the mind of the present to serve for the future.

Why, then, in our society are we always so ready to condemn everything that is popular, and take so much pleasure in disparaging what the generality admire?

This is one of the defects of our national character that we should like not to encounter among the erudite and refined class of writers whose mission it is to enlighten, direct, and instruct.

But perhaps I have said too much, when I ought to have confined myself to expressing to you the pain I felt in reading in the present number of the 'Gazette des Beaux Arts' the unworthy, disparaging expressions which the author of "The Arts that die out" has felt a right to employ while speaking of photography.

Would that I could efface from my interesting series of the 'Gazette des Beaux Arts' those two unhappy words, which will always be present to my eyes!

I hope you will insert this letter in the next number of the 'Gazette des Beaux Arts.' You owe this reparation to the large class of photographers spread through every class of society, even to the highest, who would like to meet in the 'Gazette des Beaux Arts' a protector disposed to direct photography in its path among the arts. I hope you will not refuse this reparation—or, rather, that you will prove, as you have already proved, that the spirit of the 'Gazette des Beaux Arts' can only be favourable to the interest and progress of photography.

Accept, Monsieur, the assurance of my respect.

The 'Gazette des Beaux Arts' on Photography.

To the Editor of the Photographic Journal.

Dear Sir,—As you expressed the intention of inserting in your number for January a translation of my letter to the 'Gazette des Beaux

Arts,' on the subject of a disparaging article on photography which had appeared in that journal for October, I hope I shall be in time for enabling you to publish in the same issue what we must all consider the best-intentioned reply that the 'Gazette des Beaux Arts' could give to my complaint, in an indirect but gracious manner.

This, I hope, will be considered by all lovers of photography most satisfactory, proving, as I intimated in my letter, that, notwithstanding the untoward expressions which had escaped, probably inconsiderately, the writer of the article, "Sur les arts qui s'en vont," those who superintend so admirably, so successfully, and so respectably the 'Gazette des Beaux Arts' could not countenance, for one moment, and defend a line capable of injuring photography and offending the numerous and respectable class devoted to its success.

The 'Gazette des Beaux Arts' has not inserted my letter; but the following passage, which I find in the present number for January 1866, is evidently the answer which unmistakeably has been intended as a protest against the expressions complained of, and to show the feeling of the 'Gazette des Beaux Arts' towards photography, the high opinion that journal entertains of our art, and to what extent it is disposed to recognize its merits.

I cannot do better than give you a translation of the passage I have alluded to, which is contained in an article entitled "l'œuvre de Meissonier et les photographies de M. Bingham:"—

"The photographs of Mr. Bingham are very attractive and enticing. We need not repeat here all the interest and respect with which photography inspires us. Photography is one of the most robust branches which have grown and bloomed on the tree of the science of the nineteenth century. The fruits are good in themselves. Some intelligent and learned men have applied their mind and their fortune to its development. The services which photography has rendered, which it renders, and which it will render to the fine arts, to ethnography, to history, to science, are immense, and are so much the more respectable that those who are cultivating it have not to gather the great applauses that the crowd gives to far inferior attempts. Such has been, since its foundation, the doctrine of the 'Gazette des Beaux Arts' towards one of the most curious discoveries of our age, and it will persist in it."

Certainly we must be satisfied with that honourable and full declaration of the 'Gazette des Beaux Arts.' A. Claudet.

107 Regent-street,
12th January, 1866.

REVIEW.

The Year-Book of Photography, and Photographic News Almanac for 1866. Edited by G. Wharton Simpson.

This little annual is always welcome, and is famous for the variety of its matter, the pleasing manner in which it imparts its information, and its completeness. Having made many annual appearances it has never come before us in a better form or so full of information as in the present, containing as it does an epitome of everything that is worth knowing in photography or that has occurred in the art during the past year. And all this is set forth in such a skilful manner as to render it rather a book of interesting reading than the dry collection of facts we are accustomed to look for in an almanac. To produce this result the editor has been assisted with original papers by nearly all who are of any mark in photography; indeed we do not think that *any* writer on the art whose contributions the public care to read has been omitted. Taking the names of the authors as they appear in the volume, we find practical hints on various processes and other matters interesting to photographers,—by Dr. Diamond on Calotype; T. R. Williams on Portraiture; H. P. Robinson on how to manage your Sitter, the management of a Landscape, and Doubles; James Mudd on Collodio-Albumen and Landscape-Photography; O. G. Rejlander on Photographic Art; Jabez Hughes on Glass Rooms; W. England's Hints to Tourists; V. Blanchard on Development, and Maxims well known but frequently forgotten; and papers on other interesting subjects by N. K. Cherrill, J. H. Dallmeyer, Dr. Hill Norris, H. Cooper, jun., W. Woodbury, S. Fry, and others. The landscapes of Mr. Russell Manners Gordon have attracted a good deal of attention during the year. We extract a portion of his "Hints on Landscape-Photography," in which, we think, will be found a method of practice differing from that usually employed, and to the excellence of which this gentleman's exquisite productions bear sufficient testimony.

"It is invariably my practice to stroll about the locality I intend photographing, view-meter in hand (and I advise all those who aim more at the quality than quantity of their negatives to do the same), for several days previous to commencing operations.

"By so doing no time is lost; on the contrary, acquaintance is made with the ground over which you will eventually have to pass, the 'bits' that will make pictures are carefully marked down in your note-book, as also the time of day best likely to suit each. You will then not only know where to go, when the time comes, but also where *not* to go, which, as you might have to carry a part of the photographic equipment yourself, is a lesson well worth the learning. * * * *

"The collodion I use is Mawson's, than which nothing can be better. I generally make up 40 ounces of bath at 35 grains per ounce, *very slightly* acid with nitric acid. My glass bath holds about 20 ounces; and I find that if it be carefully filtered every evening after the day's work is over, and filled up from the stock-bottle, it will require no further correcting for a long time.

"Of developers I employ two, as follows:—

No. 1.—	Sulphate of iron	25 grains.
	Water (distilled)	1 ounce.
	Glacial acetic acid	15 minims.
	Alcohol	*quantum suff.*
No. 2.—	Sulphate of iron	10 grains.
	Water (distilled)	1 ounce.
	Glacial acetic acid	15 minims.
	Alcohol	*quantum suff.*

Intensifying Solution.

No. 3.—	Nitrate of silver	7 grains.
	Water (distilled)	1 ounce.
	Glacial acetic acid	15 minims.
	Alcohol	*quantum suff.*

"Whatever quantity of alcohol per ounce is found necessary as an addition to the developers Nos. 1 and 2, must also be added to the solution No. 3; otherwise they will not readily mix, and stains will be produced on the surface of the negative. For subjects with great contrast of light and shade I prefer No. 1, as giving a more harmonious image; for distant views, including a wide expanse of horizon, No. 2, as giving more contrast.

"Flood the exposed plate with either of the above developers completely, with considerably more of the developer than is necessary to cover the plate, so as to carry off all the accumulated silver drainings.

"Many operators recommend a limited quantity of developer, in order to keep the free nitrate as much as possible on the film, as a means of increasing intensity. This, although theoretically correct, is, I consider, in practice, in landscape-photography, quite a mistake; the gain in intensity by so doing is very slight, while the bath solution, which will have accumulated at the bottom of the negative during the exposure, will, on coming in contact with the reducing-agent, increase the chance of stains a hundredfold.

"The being able to keep the two operations of development and intensification entirely separate is the most valuable property conferred by the inorganic iron developer; for if the chemicals are all in a wholesome condition (and there is no reason why they should be used at all if they are not so), any amount of intensity can be obtained in the subsequent operations.

"Having produced a well-exposed negative by means of either of the above developers, full of half-tone and delicate gradation, wash the plate, then pour over it a little of solution No. 3, allow this to flow backwards and forwards over the film for about half a minute, pour off, and apply a little of No. 1: no more should be used than can be retained with ease on the negative; for all the silver *now* present is requisite to add to the deposit on the film, and there is not the slightest risk of producing stains, as all these solutions contain exactly the same proportions each per ounce of acid and alcohol, and readily mix with each other.

"I find the above treatment is, nine times in ten, quite sufficient to give all necessary intensity. Should it, however, happen not to be so, alternate applications of the solutions 1 and 3 may be continued with, and enough intensity thus be conferred on the negative to satisfy even the most difficult to please in this respect. If the temperature be high, an application, *after* washing off the developer proper, and before intensifying, of a solution of iodine, as proposed some time ago by Mr. Wharton Simpson in the 'News,' will be found very useful in keeping the shadows free from all irregular deposit. Fix with hypo in preference to cyanide.

"Besides the above-mentioned solutions, I always carry with me two small bottles, the one containing—

Pyro	3 grains.
Water (distilled)	1 ounce.
Glacial	1 drachm.

"The other, a solution of—

Nitrate of silver......... 30 grains

to the ounce of water; for although the above-mentioned operations generally will, and certainly ought to, produce a good negative, the operator may occasionally, by aid of pyro and silver, produce effects of light and shade in his negative which it could not otherwise be made to render; therefore, after it is washed and before it is fixed, let him look carefully at it; as he examines it let him recall to his memory the beautiful sun-lit landscape he has just left—the bit of glass he holds in his hand will assist him should his memory be a bad one—and then let him, by the judicious application of a few drops of these solutions, mixed together in such proportions as he may consider best suited to the end in view, slightly increase the deposit on the distant objects represented in his negative, allowing the others to remain as they were. I have by this means frequently been able to produce that beautiful effect of distance in a landscape which is so charming to the eye in nature, and so difficult at all times to secure in a photograph."

We have, besides the usual calendar, information about all the societies, annals of the past year, carefully condensed statements of all photographic processes, both new and old, useful tables, and an epitomized list of the most important patents relating to photography that have been taken out since the last issue. Surely here is a shilling's worth that should be in every photographer's studio, and in the hands of every one who takes the least interest in our art-science.

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Opal-Glass-Printing Frame.

One of the principal, perhaps the only, objection to the universal employment of Mr. Wharton Simpson's discovery of the use of collodio-chloride of silver for printing on opal glass, was the difficulty of observing the progress of the print during exposure. Many ingenious printing-frames have been contrived for effecting this purpose, all of which, we think, have had some serious defects, one of the principal of which was, that they only allowed of the printing of opal pictures of exactly the same size as the negative. As it is almost invariably necessary to print a picture of a different size, such as the head out of a whole-plate picture, or the half of a *carte de visite* negative, containing, as they often do, two or more positions on one plate, this was an insuperable objection. We have received from Mr. Meagher, of 21 Southampton Row, Holborn, a frame, the invention of Mr. H. P. Robinson, in which he has completely overcome not only this difficulty but some others which we met with in frames previously manufactured for this purpose. Simpsontypes might now be as easily printed as the ordinary prints on albumenized paper.

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On [the Importance of Art-culture to Photographers. By Valentine Blanchard [*].

Wholesome castigation judiciously administered should be productive of some good, and therefore, at the breaking up of our photographic school for the midsummer holidays, we received a warming all round, but though sharply applied, and dealt out unsparingly to all alike, yet, on the whole, it was well merited; therefore it is right that at the commencement of this session we should show that we are the better for its infliction.

Now, to start with, it is undoubtedly true that photographers, as a body, have given but little attention to art-culture, the importance of which to all who desire to rank as artists, no matter in what department of art, no one, not even the most egotistical amongst us, would attempt for an instant to deny. It is therefore my desire this evening to place before you a few thoughts which have grown out of the suggestions thrown out by me at the annual meeting on the desirability of forming an art library in connexion with the South London Society. And, to begin with, let us briefly review the first efforts of the juvenile art-student; for the individual experience of the embryo artist may be taken as a type of the progress of all arts, and photography amongst the number.

The first efforts of the very young artist are slow, for they are barred at nearly every step by almost insuperable obstacles. The trembling and uncertain hand essays in vain to produce the straight line, and after repeated failures the ruler is called into requisition to smooth away the difficulties. But after a time comes complacency, and then follows, apparently with no effort, an almost inexhaustible series,—wonderful frigates adorned with colours that completely exhaust the resources of the birth-day colour-box; ships possessing sailing properties that completely overrule the contrarieties of wind and tide; animals whose locomotive powers are altogether original; and trees, the like of which could not be found, even after ransacking the four quarters of the globe. This fertility of resource extends over a long period, and then comes a collapse. The yearning after knowledge brings with it misery. The eyes are opened, and the old productions are looked upon with disgust instead of admiration. This is just the period when wholesome training is needed, in order to make the artist. The writings, and, more than all, the examples of the great veterans in art, exert their influence on the mind of the student; for an examination of their works shows the plans and technicalities forced upon them by their necessities, and the shortcomings of all human methods of interpreting the inexhaustible wonders of nature. And then too frequently, arising out of the depth of reverence for the great teacher, there follows a period of servile adherence to the rules which age has made venerable, the more especially as in the schools the art canons are held as almost infallible; and thus rule, precedent, and method, instead of being used as means by the way, are ostentatiously displayed as the all in all in art. But with the modest and earnest student this does not last long; for after a while, gathering strength from his labours, he throws away the leading-strings, and, instead of accepting the interpretation of others, he dares to interpret nature for himself.

From this moment commences the student's success; for though freed from the fetters, the beneficial influence of his training will be felt constantly. Having once acquired the power of seeing for himself, he will be surprised how wonderfully the capacity of the eye will increase daily; for the brain, though constantly fed by his obedient servant, grows hungry on what it feeds on, and eagerly craves perpetually for more.

There is, however, a great difference between the progress of the artist and that of the photographer. The artist, from the moment when he commences his career in earnest, has before him perpetually the greatest works of the greatest minds. In his comparatively elementary studies he is probably engaged in drawing from a reduced cast of the Clytie or the Venus de Medicis, and thus a double process is going on at the same moment; for whilst he is educating the eye to accurately measure proportions, he is also at the same moment refining his taste by a study of the great works of the master minds of ancient Greece and Rome.

The photographer, on the other hand, after passing through the probationary period, when after much anxiety he produces his first image on the glass or paper, is engaged on nothing which tends gradually to cultivate the eye for the more subtle beauties of nature; but on the contrary, the necessity of acquiring his process is constantly leading him away from that which should be his main object, and to which everything else should be subordinate, viz. the most perfect rendering of nature, not only in her every-day aspect, but in her rarer and grander moments.

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[*] Read at the meeting of the South London Photographic Society, Nov. 9th.

Now I do think most earnest photographers have got into the transition stage to which I have before referred. Self-complacency has nearly disappeared. Manipulation yields perfect chemical results with but little difficulty, and yet a great want remains unsatisfied. It requires no great effort on the part of the photographer to secure the outer semblance of nature, but the spirit is, except in very rare cases, absent, and the great question now is this:—Have we reached the limit of our art, and can we go no further? or must we remain at the outer gate, and go on polishing and repolishing process after process, with no hope beyond?

I firmly believe that there is still a greater future for photography. It is true that colour is shut out from us; but when we remember that the painful labour of years is needed to produce a first-class line engraving, the question comes home strongly to us, have we thus far thrown enough self-denial and earnestness into our labours? We possess such unusual facilities for the perfect rendering of minor details, so much painful labour is spared us, that I do think that with the amount of thought bestowed by the engraver on his work, and a tenth part of the patience, we should produce something that would be recognized by all as a worthy product of so wonderful a discovery as that of photography.

We have much to encourage us. A few men can be named who have been self-denying, and have, in consequence, produced something worthy of the art. Rejlander's "Two Ways of Life" was a wonderful first attempt at composition in photography, and clearly shows that nothing would be impossible to him did he choose to go on in that direction; and whilst I write, Robinson's "Autumn" is before me; and, in spite of adverse criticism I say it after a close examination of the works of many great engravers, it is the most truthful landscape I have yet seen executed in monochrome.

The question comes, could either of the works I have named have been produced without a very considerable amount of art-culture? Undoubtedly not. Here comes in the value of art-knowledge. Instead of blindly putting the camera in front of something, and allowing it tamely to do its work and photograph indiscriminately all that came before it, long and earnest thought was necessary before the camera commenced its labours. In the "Two Ways of Life," noble aspirations and ignoble passions had to be portrayed and woven together in a connected and dramatic plot. The elaboration of the story having been finally determined on and sketched on paper, then, and not till then, came the photographic difficulties of carrying out. In the case of Robinson's "Autumn" the same course had to be adopted. The sketch was fully made on paper and well thought out before the photographic part was attempted. How much has been achieved by Mr. Robinson in consequence of his art-knowledge will be at once apparent on an examination of his "Stoneleigh Park," which is the background of his greater picture "Autumn." Here we have a very sweet bit of English rural scenery, and nothing more. But look at the completed picture. The introduction of the foreground with its figures has made all the difference. How much more sympathy we have with the work, and how much more its influence grows on the mind! Our eye mechanically follows the direction in which the maiden looks whose hand is raised to protect the eyes from the glare of the afternoon sun; and we at once feel the influence of the heat, and are fully conscious of the golden shimmering glare which half blots the distant trees, interposing a palpable heated atmosphere between the spectator and the distant thicket, and making the grateful shade of the foreground quite acceptable.

[To be continued.]

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THE EXETER GRAPHIC SOCIETY.

At the monthly meeting of the Exeter Graphic Society, Dr. Scott, the president of the society, read the following Paper,

On Photographic Portraiture.

The subject which I venture to bring before you this evening is one connected with Photographic Art: and I do so, first, because I am unwilling that we should drift away altogether from our old love—photography; and secondly, because now that every one has his or her portrait taken in photography, it is well that there should be a wide-spread knowledge of the art in reference to its capabilities for producing pleasing portraits.

Photographic art requires the knowledge of several sciences, if a man would practise it more than empirically. He should be a chemist and an optician, and to produce pleasing pictures he should also be an artist. But it unfortunately happens now that a man may follow (and often does so) the art without any pretence to these qualifications. The materials and other means for practically producing pictures have been so reduced to rule, that any man whose fingers are not all thumbs, may practise it. Hence it is that it has lost much of its original charm for amateurs, and in our own little society we find that our photographers have fallen off; for they consisted chiefly of gentlemen who followed the art for the scientific interest they took in its relations to chemistry or some other branch of science, or for the hope they had in its becoming an important handmaid to art. Men who now follow the calling for profit, especially in portraiture, seldom have more interest in it than for the gains which it brings; and hence we see so few of practical photographers really art-students. Of course there are exceptions; but as a general rule photographic portraiture displays a most unfortunate lack of artistic knowledge; and one can only suppose this to arise from a want of artistic feeling, and an ignorance of the capabilities of photographic science. We cannot look at the great mass of photographic portraits without being struck with the utter absence of all artistic treatment which they display, in their bad arrangement of lines, their want of subordination of parts, the distortion of features, and a total neglect of consideration as to what will be the effect produced by different-coloured dresses on the photographic image.

In considering the question of photographic portraiture this evening, then, I shall arrange my observations under the following heads:—1st, the defects arising from a want of due appreciation as to how different colours affect the photographic image; 2nd, the optical errors producing distortion of features; and, 3rd, the artistic defects arising from a bad arrangement of lines, insufficient subordination of parts, and bad chiaroscuro.

First, then, as to the effect of different colours in producing dark or light tints in the photographic image. Persons when they go to have their portraits taken—especially ladies—generally dress in such costume as appears becoming and ornamental in colour as well as in form; and, from the correct taste so general amongst the fair sex, could the photographic art give us colour as well as form, no doubt there would not be much to complain of. But this is not the case. Photography has as yet only given the various tints from black to white; and it is often from a want of knowledge, or a want of attention, as to how various colours will "come out" in depth of shade in relation to each other, that so many unfortunately treated portraits meet our eye. In photography the sunbeam is our pencil, and a surface covered with certain chemical preparations our drawing-board, and it is in knowing how the one acts upon the other that our part of the art lies. Every beam of light consists of a bundle of rays, each ray having a distinct colour, and a different effect upon the ground prepared for our picture. If we allow a pencil of sunlight to fall upon one angle of a prism we separate these rays, and we have an elongated image presenting us with various brilliant colours. This image is termed the solar or prismatic spectrum. These colours arrange themselves always in one succession. In the spectrum we see that the rays have different degrees of refrangibility. The red ray is least refracted, and the violet ray, which we see at the other end of the spectrum, is the most. But though the rays usually represented are the only ones visible to the naked eye, there are other rays at each extreme end of the spectrum, which can be detected if we use the proper means. If, for instance, we look through a deep-blue glass, we shall find beyond the visible red ray a ray of a deeper red, and which is now distinguished as the deep-red or crimson ray. Again, if we allow the spectrum to fall upon a sheet of yellow paper, a ray will appear beyond the violet ray at the other extremity, which Sir John Herschel has named the lavender ray; while still beyond this again Mr. Stokes has shown that, by throwing the spectrum upon a solution of quinine, we can get a prismatic image. The interest connected with the prismatic spectrum would tempt us to dwell upon it for a longer time; but as already enough has been said for our present purpose, to do so would lead us away from the subject more immediately under our notice.

We have seen, then, that the sunbeam consists of a series of rays, illustrated in the spectrum under the different colours. These rays have been found to be endowed each with different powers. Light and heat were long considered the only qualities of sunlight; but more recent experiments have added another property, which has been designated actinism; and it is this power which enables us to take photographs. The illuminating rays do not do so, nor the heat-rays; but in the chemical action of the actinic rays lies the solar force by which we can take photographic pictures. Of the different rays which have been found connected with these different powers of *Light*, *Heat*, and *Actinism*, the maximum of actinism lies in the violet ray, and its minimum is in the yellow ray; while, on the contrary, the maximum of illumination resides in the yellow ray, and its minimum in the violet. It is this feeble power which yellow light has on the photographic plate that enables us to work by the light of a candle, or sunlight transmitted through yellow curtains. If all the rays of light were equally powerful in actinism, of course we should have to work in the dark. Again, the heat-rays have their maximum power in the red rays, and their minimum in the violet. We have actinic power beyond the visible spectrum, extending to that blue ray which I stated Professor Stokes had made visible by means of a solution of quinine. Having thus seen that the sun's rays are not all equally operative as photographic agents, but that only some of them are endowed with this power, you will be better prepared to see how it is that such remarkable phenomena occur sometimes in taking portraits as do occur when ladies go dressed in certain colours. You are aware that colour is not an inherent quality of matter; colour in objects is produced by their reflecting certain rays of light and absorbing others. Hence blue objects absorb all other rays, and only reflect the blue ones, while red objects reflect the red rays and absorb the others; the yellow objects in like manner absorb all rays but those which are yellow, which they reflect. Now, a lady going to have her portrait taken in a yellow dress, would naturally think it would come out of a lightish hue, and she would be very much surprised to find that it came out almost black. But such is the case, and for the reasons I have endeavoured to explain to you in my remarks upon the prismatic spectrum. Hence, if a lady wishes to appear in any particular tone of dress, it is of great importance that the proper colours be selected, and not such colours as will produce darks for lights, and the contrary. Again, gentlemen in blue-grey dresses come out very light, and are generally much too light for the dark coats which are often worn with such colour, giving a violence in contrast that gives an unpleasing aspect to the photographic picture. Again, it is difficult to get a dark dress and the flesh-tints both properly done together, the radiations from the light complexion of the skin being much more effective on the photographic plate than those from the dark dress. It takes tact and experience, therefore, to give that proper medium of time which will do best for both without considerably injuring either. But as the face is or ought to be in all cases the most important part of the portrait to have satisfactorily done, everything else should conduce to this end. It is, then, of the utmost consequence in dressing for a photographic portrait, to consider well the colours, not as regards their harmony as a well-balanced combination of colour, but as to what they will produce on the prepared plate.

It is very common to see ladies going in dark dresses, with long floating ribbons, or cap-strings of white or blue, large white collars and cuffs, &c., producing pictures of such violent opposition, and blotches of white far larger than the face, that this feature has to be sought for in the picture to be found out, so much is it thrown in the shade by the parts of dress that I have mentioned. Thus effects are produced very different from what the sitter expects, and very opposite to what is either desirable or pleasing. For this wearing of ornamental borders, white collars and cuffs, long floating cap-strings, with white handkerchief in hand, is the ruin of many portraits that otherwise might be passable. All those white objects come out as so many spots in the picture, frequently entirely without any shadow to give us folds or texture in the material, and spoiling in every respect the effect of the picture. It may be difficult for a photographic artist to interfere with the dress of a sitter; but yet, as sitters cannot be expected to know the capabilities of the art, it is certainly due to his patrons, as well as to his own reputation, that he should be particular in insisting on parties wearing such dresses as are best calculated to produce satisfactory results. The great principle of dress is that it should be of a quiet hue, and as little as possible interfered with by the introduction of any colour that will produce a violent contrast; for breadth and quietude are necessary to give sufficient importance to the face. Indeed, in pictures so small as "Cartes de Visite," you cannot afford to have any white spots or patches. If they are introduced it will be at the expense of the face. The best plan, therefore, is to let the dress be of one quiet colour, keeping even the hands in an unobtrusive position, so that the face shall stand out the chief feature of the picture, so as to catch and retain the eye, without being interfered with by anything else.

[To be continued.]

◆

City of London Exhibition.—The Corporation of the City of London, a few days ago, unanimously voted the use of the Guildhall, recently repaired at great cost, for the purposes of an Industrial Exhibition, to be inaugurated on the 1st March, 1866. On the motion of Mr. Lampray, F.R.G.S., F.A.S.L., of Paternoster-row, member of the General and Executive Committees, it has been determined to devote the surplus funds towards the establishment of a Free Public Library for the City of London, to which several city firms have already expressed their intention of liberally contributing, and towards which, it is believed, the Corporation will also lend its aid.

All communications for the 'Journal,' and on business relating to the Photographic Society, may be addressed to the Secretary and Editor, at Messrs. Taylor and Francis's, Red Lion Court, Fleet Street, E.C.

No. 166. FEBRUARY 16, 1866.

THE PHOTOGRAPHIC JOURNAL,

BEING THE

JOURNAL OF THE PHOTOGRAPHIC SOCIETY.

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PHOTOGRAPHIC SOCIETY.

The next Meeting of the Society will take place at King's College, on Tuesday, March 13th, when Mr. Dunmore will read a paper on the "Organico-Iron Developer." Mr. Dallmeyer will also probably read a communication on a "New Triple Lens for Portraiture and Groups."

Meetings of the Society, 1866.

1866. Tuesday,	March	13
„	April	10
„	May	8
„	June	12

PHOTOGRAPHIC SOCIETY OF LONDON.

Annual General Meeting.

King's College, London.

Tuesday, February 13, 1866.

H. G. Wright, Esq., M.D., V.P., in the Chair.

The Chairman opened the proceedings by observing that it had been the intention of the Lord Chief Baron, President of the Society, to attend this the Annual Meeting; but he regretted to state (and he was sure the Members would all share in the feeling) that the following note had been received from their esteemed President:—

Hatton Hounslow, Feb. 13, 1866.

Dear Dr. Diamond,—I am confined to my bed by a cold and fever. I have written to Twickenham; but for fear that should miss you, I send this note to King's College, where I am quite unable to be this evening.

Yours truly,
Fred. Pollock.

From this note it would be seen that, though he could not be personally with them, the Lord Chief Baron was present in spirit; and the Members would, he was assured, join the Council in regretting the absence of the President on this occasion and the cause of it.

The Secretary read the Minutes of the last Ordinary Meeting, which were confirmed.

The following gentlemen were elected by ballot Members of the Society:—

Mr. John Werge, 379 Oxford Street, London.
John C. Belton, 13 Clifton Villas, Camden Square.

Mr. Dawson said he wished to ask the Chairman whether he (Mr. Dawson) was considered a Member of the Society. He referred to the circumstances already reported in the Journal in connexion with his resignation, and read the correspondence which had subsequently passed between him and the Secretary on the question of his reinstatement.

The Chairman said that, according to the rules of the Society, a Member having tendered his resignation, could only be reinstated by being ballotted in as at the first. He believed he expressed the opinion both of the Council and of the Society at large when he said that, however desirous they might be to receive Mr. Dawson among them again, he was not at the present moment a Member.

After some further conversation on the subject, the names of the following gentlemen were submitted by the Council for election as officers, &c., during the ensuing year:—

PRESIDENT.

The Lord Chief Baron, F.R.S.—re-elected.

VICE-PRESIDENT.

Mr. Bedford—re-elected.

TREASURER.

Mr. White—in place of Mr. Hamilton.

NEW MEMBERS OF COUNCIL.	RETIRE.
Mr. W. Warwick King.	Mr. Shadbolt.
Mr. Jabez Hughes.	Mr. Hennah.
Mr. R. Manners Gordon.	Hon. W. W. Vernon.
Mr. Edw. Kater, F.R.S.	Major Gresley.
Mr. Joseph Durham.	Joseph Durham.
Mr. Hamilton (late *Treasurer*).	Mr. White.

The CHAIRMAN then read the Annual Report of the Society as follows:—

IT is the duty of your Council to lay before the Members of the Society at each Annual Meeting a Report of the general concerns of the Society for the preceding year.

In presenting the Thirteenth Annual Report of the London Photographic Society, your Council may express their confident belief that the photographic art has continued to steadily advance throughout the past year, and refer with justifiable pride to the many valuable and interesting communications laid before the Meetings of the Society, and which especially indicate an increased interest in all that concerns the scientific progress and commercial advancement of Photography.

It will be seen, by a reference to the balance-sheet hereto appended, that the ratio of expenditure and receipts is in accordance with that of former years, and that the ordinary expenses of the Society have been within the income of the year.

During the summer months the Society opened an Exhibition in Conduit Street, in conjunction with the Architectural Society.

The space, although somewhat limited, afforded ample room for the proper display of all the varieties of beautiful photographs which were exhibited; and it may be safely affirmed that no Exhibition has exceeded in interest that of the past year: in fact, it may be asserted that, for general excellence in the specimens, it far excelled all former Exhibitions.

Although this Exhibition was well attended, and conducted almost free of expense to this Society, it was not financially successful. The general distribution of photographs throughout the country, and their now forming an object of attraction in almost every family, together with the fine collections for sale, not only in London, but in all the chief towns of the kingdom, render it very improbable that any Exhibition can ever offer sufficient attraction to induce visitors to attend it in sufficient numbers to make it remunerative to the promoters. For whatever success may have attended our last Exhibition, and for the comparatively small amount of expense entailed on the Society, it was indebted to the exertions and support of Mr. Cole, one of the Members of the Council. That gentleman was not only instrumental in bringing about the favourable arrangements made with the Architectural Society, but he also gave a guarantee against loss. Your Council feel that the most cordial thanks are due to Mr. Cole for his perseverance and liberality in the matter.

The promise made on the occasion of the last Anniversary, to present to the Meetings a series of good papers, has been most fully maintained. During the entire year, on no occasion has there been any deficiency, and on some of the evenings the Meetings have consequently been prolonged to a much later hour than is usual.

The following papers may be mentioned as some of the more important ones; and your Committee feel called upon to again especially thank the authors for the willingness with which they have responded to the call which was made on them, and for the excellence of the papers:—

Mr. G. WHARTON SIMPSON, on a New Method of Printing, and the Preparation and Use of Collodio-chloride of Silver.

Mr. WILLIS, on the Aniline Process of Photographic Printing.

Mr. DALLMEYER, on a New Form of Landscape Lens, including a large angle of view.

Major RUSSELL, on Dry-plate Photography.

Mr. PETTITT, on Photo-Binography.

Mr. ROSS, on some early Lenses and Cameras, accompanied by illustrative and early photographs.

Mr. JABEZ HUGHES, on the Preparation of the Iron Developer so as to produce Dense Negatives. Also a second paper on the same subject.

Mr. HENRY COOPER, jun., on Printing with the Salts of Uranium. On an Improved Formula for making the Organico-Iron Developer. (Two communications.)

Mr. N. K. CHERRILL, on the Organico-Iron Developer.

Mr. WALTER B. WOODBURY, on a New Photo-Relief Process. (This paper was illustrated by the author.)

Mr. MAYALL, on the Construction of a Photographic Glass Room.

The objects exhibited at the Ordinary Meetings have been numerous, and some of the greatest possible interest, amongst which may be especially recorded the earliest specimens of carbon printing (those executed by M. Poitevin in 1855), also the latest results of Mr. Swan's researches, which have reached a degree of perfection that can scarcely be surpassed.

The Council regret that some observations made by the Editor of the 'Journal' on the communication of Major Russell, and which they believe were not intended in the light in which Major Russell viewed them, together with some other causes, led to an invidious attack on one of your Vice-Presidents; and at the Meeting of the Council (twelve Members being present) held in December, a resolution was unanimously adopted expressing the full conviction of the Council that the statements made in the 'British Journal of Photography,' of November 24, 1865, personal to Mr. Glaisher, were entirely unfounded and unjustifiable.

In reference to this matter, a Special Meeting of the Members was convened, the results of which have been faithfully and truly recorded in the 'Journal,' and to which it is not needful further to allude; your Council feel satisfied with the results, and that the honour of the Vice-President so unjustly assailed has been fully vindicated.

The Medal which has been awarded is now prepared, and an impression* is this evening laid before you. It may, the Council believe, be considered a work of high art, equalling, if not excelling, any similar production. In the course of a very short time those already awarded will be delivered.

Mr. Durham has kindly consented to execute, and will present to the Society, a medallion portrait of our President, the Lord Chief Baron; and from this will be produced, as soon as possible, another die; so that the proposed "President's Medal," destined for such purposes towards the advancement of the art as the Council shall think fit, will soon be proceeded with.

The Council cannot conclude their Report without alluding to the pleasure and advantages resulting to the Society by acting in unison and friendly feeling with other societies; and with satisfaction they refer to the good understanding which exists between the Council of the North London Photographic Association and their own body, by which the 'Journal' of the Photographic Society of London has become the official organ of that Association, in addition to that of the Photographic Society of Scotland, with which institution this has so long and so agreeably been associated.

The Secretary laid the Balance-sheet of the Society for the past year upon the table.

Statement of the Accounts of the PHOTOGRAPHIC SOCIETY, for the year ending 31st of December, 1865.

Income and Expenditure Account.

	£	s.	d.	£	s.	d.
General Expenses	232	10	6			
Exhibition Account	6	13	4			
Soirée Account	14	4	2			
Property Account	2	15	9			
Profit and Loss Account (Loss on Sale of Consols)	11	19	10			
Interest (Archer Fund)	6	0	0			
				274	3	7
Balance				436	15	10
				£710	19	5

	£	s.	d.	£	s.	d.
Balance from last year				398	15	9
Entrance Fees and Subscrips.	291	8	0			
Journ. Ac. (Estimated Profit)	17	13	8			
Interest	3	2	0			
				312	3	8
				£710	19	5

Balance-Sheet.

Assets.	£	s.	d.
Sundry persons for Advertisements	144	1	5
Balance at Bank	61	18	0
Subscriptions in Arrear (say)	100	0	0
Property Account (Estimated Value)	25	2	3
Photographic Journal (Value of Stock)	255	12	9
	£586	14	5

Liabilities.	£	s.	d.
Taylor and Francis, balance due them	107	5	11
King's College, due for Rent, &c.	39	12	0
Dr. Diamond, due to him on P. C. Acct.	3	0	8
Balance as above	436	15	10
	£586	14	5

We have examined the above Account, compared it with the Vouchers, and find the same correct.

London,
February 8, 1866.

CHARLES HEISCH, } *Auditors.*
HENRY CLAUDET, }

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* This is in soft metal: one of the dies, after it was entirely completed, failed in the hardening—a piece having, from some unexplainable cause, come from the centre of the reverse; and it is thought advisable not to run another risk of damaging the die until it has been fully tested.

Mr. **Jabez Hughes**, in moving the adoption of the Report, said he had no doubt the Members generally had been much gratified in listening to the statements which that document contained. It was pleasant, in the first place, to know that the vital element in all societies—the sinews of war—were, in the case of this Society, all right. They had had reports presented to them in past years, which proved they were not in that happy condition—in fact when the balance was altogether on the wrong side; but fortunately a change had taken place in this respect. The next feature of interest in the Report was the significant statement that the prosperity of the Society was but the reflex and representation of the general extension, recognition, and thorough establishment of photography, not merely as one of the adornments of the present time, but as one of the wants and acknowledged necessities of the age. They might therefore feel confident, and congratulate themselves on the fact, that though in its onward progress photography might meet with little difficulties and hindrances, yet, having now obtained such a status as removed it altogether beyond the regions of curiosity, its essential importance would in all future time continue to be recognized. It was always an interesting study to watch the development of our art, and the reports of this Society furnished them, in a concentrated form, with the materials for judging year by year how photography was advancing. He was pleased to notice that in the Report allusion was made to the various interesting contributions which Members of the Society and others had made at their Meetings during the past year. Thanks were offered to those gentlemen, and had it not been that he himself had taken part in those contributions, he should have felt at liberty to speak more freely and definitely on this subject, because he regarded it as a feature in the proceedings of special interest. In former years the want of such communications was one of the weakest elements in the Society; and on more than one occasion he had been present at meetings at which there were no papers to read, scarcely any exhibition of apparatus was made, and none of those novelties displayed which now almost always were being brought under their attention. During the past year, however, they had had a great accession of the practical exposition of photography in every possible form, so that he was quite justified in asserting that their meetings represented truly the current condition of the art. With reference to that portion of the Report in which allusion was made to the charges brought against one of the Vice-Presidents, he would only remark he was sure all the Members present would entirely agree that it was necessary those charges should be investigated, and would rejoice that in the result their Vice-President, to whom they were so much indebted, and in whose vindication they were bound to assist, was entirely exonerated. The course adopted towards that gentleman was exactly the course which a society like this ought to adopt. With these remarks, he begged to move the adoption of the Report.

Mr. **Bedford** seconded the motion, which was put and carried unanimously.

Mr. How exhibited and explained the construction and advantages of Sarony's Patent Posing-apparatus and Rest. This apparatus was described and illustrated in the last number of the Journal (pp. 241 and 242).

Mr. **Mayall** said, in justice to the inventor of this very ingenious instrument, he thought it right to say that for the last few weeks he had tried it, and found it effected most efficiently what had been almost looked upon as a hopeless case, the means of taking the portrait of a tremulous palsied sitter. The value of the instrument as a rest was enhanced very materially by its extreme simplicity, and in the application to its construction of the good common-sense notion of putting plenty of material in it, so as to ensure perfect firmness. It most effectually answered the purpose for which it was intended; but he would suggest that it was rather too heavy, and that it required the introduction of a coil or spring in the pedestal or tube to check the fall of the upper position, which might be attended with serious inconvenience. The mechanical principles applied in the apparatus were of the most simple and beautiful character, and so judiciously taken advantage of, that the operator could get any possible pose which might be desired. He had no hesitation in saying that photographers who were "afflicted" with children during winter time, would find here the means of getting over these "little difficulties." Although the instrument had been patented, the cost of it was put down so low as to lead to the hope of its general adoption. For ladies, he was certain it would be found of great use; it would give them confidence, and photographers would have less trouble in getting them to sit still.

The **Chairman** called attention to three pictures exhibited by Mr. Cooper, taken by Dallmeyer's new triple-portrait lens. He also read a letter from Mr. Dallmeyer, to the following effect:—

19 Bloomsbury Street, London,
Feb. 13, 1866.

Dear Doctor,—I send you herewith a few pictures taken with a lens I have lately constructed for Groups, Studies, &c., *in doors.*

At the next or following Meeting, I shall be prepared to give a description of this lens.

Your's very truly,
J. H. DALLMEYER.

Dr. Diamond.

A beautifully got-up album by Mr. Ernest Edwards was exhibited, containing photographs taken in Switzerland during the past year, and intended for presentation to the Alpine Club.

The CHAIRMAN said there was another matter which it was his duty to bring before the Society, and to call the attention of photographers in general to. It was a matter which, had the Lord Chief Baron been able to attend, he would, no doubt, have made a point of referring to, since it was one of great interest in connexion with photographic art. It related to the establishment of national and local museums or galleries of photographic portraits of celebrated persons. The movement originated with Mr. M'Lachlan, of Manchester, and the prospectus issued by that gentleman he would now read.

National and Local Photographic Portrait-Galleries and Museums.

To the Photographic Profession.

ON the 16th of July, 1863, I made public a plan for the systematic collection and preservation of authenticated photographs of distinguished individuals, by the establishment of national and local galleries or museums, under corporate or other authority and control.

I am happy to inform you that the Corporation of Manchester have adopted the suggestion, and that a Committee has been formed for carrying it into immediate operation, in accordance with the resolutions annexed.

The value of the proposal has been so fully recognized by the press, and is so self-evident, that it is needless to enter into an explanation of its advantages; but it is desirable that the general principles upon which it is intended to carry it into operation should be made known.

In order that the utmost security may be given for the permanency of the portraits, the adoption of two methods is proposed. By the first, the portraits would be transferred and enamelled by the process of M. Lafon de Camarsac, or by other similar methods; and as a guarantee of authenticity the corporate arms, with the signatures of the Mayor and Town Clerk, as well as the autograph of the individual, would be burnt in on the reverse side. By the second method, negatives or positives by transmitted light would be hermetically sealed by a process devised by Mr. Daniel Stone, chemist, of Manchester.

It is hoped that no urgent appeal need be made to photographers generally, to induce them to assist in establishing, in a creditable manner, an institution which will secure such important results, which will at once throw a lustre upon their profession, and remain a monument of the great value of the art.

In soliciting contributions, I beg to offer an observation as to the manner in which the greatest service can be rendered in furthering the project.

It is of the highest importance to secure the likenesses of all distinguished persons whose portraits have been taken from the earliest days of photography, and, by obtaining these, the Committee will be obliged in an especial degree.

In all cases the gift or loan of the negative will be desirable; but, if that be objected to, a positive, by transmitted light, will be received. In this case it should be accompanied by an unmounted print from the negative.

It is very desirable that the portraits selected for enamelling should be uniform in size, the head to be 1¼ inch, filling an oval of 3½ inches, and, if a transparency be offered, these dimensions should be adhered to; but I need not say that the negative would be preferable. Every portrait will bear the name of the contributor; an official receipt will be given for the same, and lists published in the photographic journals, periodically, of all contributions received.

In transmitting negatives or transparencies, the names and designations of the portraits should be supplied.

All communications should be addressed to me, and I shall be happy to afford any further information that may be required.

I am,
Your most obedient Servant,
LACHLAN M'LACHLAN,
Honorary Curator.

Cross Street, Manchester,
10th January, 1866.

The city of Manchester had taken up the question, as would be seen by the following—

[Copy.]

City of Manchester.

At a Meeting of the Photographic Museum Subcommittee of the Council of this City, held on the 3rd day of January, 1866,

THE MAYOR IN THE CHAIR,

It was unanimously resolved—

> "That it is desirable, at once, to take steps for the formation of the Corporation Photographic Museum."

Resolved—

> "That Mr. M'Lachlan be and he is hereby authorized and empowered, on behalf of this Corporation, to make application to leading photographers for donations, for the purpose of the Photographic Museum of Negative or Transparent Portraits of distinguished individuals of this or foreign countries; upon the distinct understanding that the Corporation guarantee that any negatives or transparencies which may be liberally contributed shall not, in any case, be used for any private or trade purpose, but shall be systematically and carefully preserved, and used only with the express authority (in writing) of the Corporation, for public purposes."

Resolved—

> "That the Town Clerk be authorized and requested to furnish Mr. M'Lachlan with a copy of the above Resolutions."

(Truly extracted.)

(Signed)

Joseph Heron, *Town Clerk.*

Mr. Lachlan M'Lachlan,
Cross Street, Manchester.

On the strength of that resolution, Mr. M'Lachlan now appealed for cooperation to photographers at large. In bringing the matter before the Society, he (the Chairman) wished to call attention to a portrait of the late Prince Consort on the table, which he believed was intended by Mr. Mayall to form one of his contributions to this collection at Manchester. It was to be noticed that this was the first public recognition of the photographic art by a corporate body or by the local authorities of any large town. Whatever had been done hitherto had been done by numbers of gentlemen associating themselves together for the advancement of the art, getting up an exhibition, or for their own special instruction. Here, however, was a definite recognition, by the large and important city of Manchester, of the value of photography in supplying the means of handing down to posterity correct representations of the great men of the day. A few years ago the accomplishment of this would have been impossible. Before the discovery of the mode by which photographs can be made permanent, no one would have cared to transmit one to his descendants—judging from the appearance which photographs produced at that time would cause him to present to his grandchildren. But the great improvement introduced by M. Camarsac and Mr. Wharton Simpson (whose process, he believed, had been adopted in the portrait now exhibited) in rendering portraits permanent, warranted the view which the corporation of Manchester had taken, that they would be able to establish a collection of portraits almost equal in immediate interest to the famous collection in London, and at the same time far less expensive. He should be glad to hear any suggestion the Members wished to offer on the subject, and he was sure the Corporation of Manchester, who had started this Exhibition, and to whom great credit was due for fostering the idea, would be glad to receive such suggestions from so important a body as the Photographic Society of London, and to learn that their proposition had received the sanction and approval of this the first Photographic Society in the world.

Mr. Mayall thought they should not allow so important a communication as that just read by the Chairman to pass without the Members of the Society taking cognizance of the fact that this was the first time photography had been recognized as of so much importance as to justify the formation of a Museum by the corporate body of a great city like Manchester. He happened to know one or two of the gentlemen who had taken an active part in this matter, more particularly Mr. M'Lachlan and Mr. Heron the Town Clerk, and he was sure, from the zealous manner in which they had taken up the question, and the considerable expense they had been at, there was an ample guarantee that the proposal would be most efficiently carried on. Nearly every photographer would be able to contribute something to so important an object: most of them would feel a pleasure in doing so gratuitously; but, if need be, the corporation of Manchester were prepared to pay for the portraits of eminent men. He (Mr. Mayall) intended to contribute a dozen portraits of the late Prince Consort in different positions, so that it would be impossible for any future Durham to fail in getting a perfect likeness, if he desired to prepare a bust of the former patron of this Society. It was impossible to overrate the importance of such a museum in future time. Mr. Claudet and himself were in possession of many hundred portraits of men of eminence, and no doubt photographers all over the country would be able to add to the collection a large number. There was nothing in the establishment of such a museum in Manchester to prevent a similar effort being made for the Metropolis, with duplicates of the same portraits or any others. There was one feature in Mr. M'Lachlan's proposal which seemed to him rather singular, and that was that the portraits should be sent to France to undergo M. Camarsac's process. He (Mr. Mayall) in 1855 exhibited to this Society a series of little portraits, which eventually found their way into the hands of the Queen. They were done by a process which he explained in 1859, and which, if adopted now, would save the necessity of sending to France. He got a piece of copper which was glazed over with a kind of black glaze of glass. He then prepared a collodion surface with a very acid nitric-acid bath; upon this he took a positive image, and fixed it in cyanide of potassium, washing it over very carefully. It was then put into a muffle furnace (it was astonishing how much heat an ordinary photograph would stand before the image was destroyed) with a little spatule of porcelain, till it got slightly heated, when it was taken out, a piece of thin microscopic glass placed over it, and again placed in the muffle. Almost in a moment this was melted down upon it, and the portrait became hermetically sealed. Now, as the positive image taken with a very acid nitric-acid bath was almost pure silver, or silver in an extreme state of reduction, there was nothing in that image which could possibly fade if fixed with cyanide of potassium. He had now a muffle ready for trying Mr. Simpson's process, and he had no doubt he should succeed. With reference to the establishment of such museums as had been inaugurated at Manchester, he would only add, that he thought it very desirable that all the learned societies in London should take up the idea, and perpetuate the memory of their great men by handing down their portraits to a future generation. Many of these great men were now passing away, and it would be most satisfactory to have their portraits preserved.

Mr. **Durham** said, with regard to the use of photography in art, it was not necessary to make many observations; but this he might remark, that it unfortunately happened very frequently that persons were not employed to paint a picture or produce a work in sculpture till the eminent man it was desired to preserve a memento of had passed away. Then it was that friends and relatives and admirers began to think it right to have some permanent record. Hence he apprehended that to all future time collections of actual portraits would be of the most essential service to art. For his own part he frankly acknowledged that he was deeply indebted to photography. The first thing he now did in preparing a bust, if the person was living, was to obtain a photographic portrait, which he sometimes had enlarged. From this he found that he could work, for he had merely to measure the head; the rest all fell in with practice. The result was, that when persons came to sit to him, they found his work was so good a likeness that he had heard them say "it is of no use going on any further, you will never get it more like;" and this was in working from the photograph alone. He remembered that in the year 1850 he was intensely puzzled in getting a likeness of Guizot; he never saw that great man look twice alike, and would have been glad enough to have a photograph of him. After Guizot had about six sittings of an hour and a half or perhaps two hours each, he apologized for having taken up so much of his time, he replied "Don't mind that, when I sat to Paul Delaroche for a profile, I sat a countless number of times." Photography, by reducing the number of hours required for this purpose, was a boon alike to artists and to sitters. The latter was no small consideration, because to sit for a portrait was a most uncomfortable thing. One always seemed to think there was something requiring to be done, without remembering what that something was. For himself he could candidly say that he never sat for his photograph without feeling himself perfectly miserable, and no doubt when folks sat to him it was just the same. He did not like to work at them with their mouths down and their eyes *blasés*—when he found them like that he left off looking at them and turned to their photographs.

Mr. **Mayall** said he thought the manly way in which Mr. Durham had spoken was a complete answer to those artists who affected to despise photography, but who no doubt, in secret, were glad to avail themselves of its services.

Mr. **Jabez Hughes** said it could not be disputed for a moment that it was very desirable to have historical portraits possessing the unchallengeable character of good photographs. The idea having been once started, he hoped many other corporate bodies would follow the example of Manchester. But the proposition would never be fully and properly carried out until it was taken up in London. While, therefore, he accorded the highest praise to Manchester for initiating such collections of portraits, he expressed an earnest hope that London would not be long behind. In reference to the suggestions in Mr. M'Lachlan's prospectus respecting the size, &c., of the portraits presented, he said he thought it would be well, wherever practicable, that they should be stereoscopic. Such portraits had a double chance of not being destroyed by accident, and when placed in the stereoscope a new photographic truth was revealed, which was not evident at first sight, and which, for artistic purposes, would be valuable, the sense of projection giving an element of character which the plain simple picture did not give.

Mr. **M'Lachlan** said, his first proposition was that they should be stereoscopic, but it was found that, for that purpose, many portraits would have to be taken over again, and therefore he did not press it.

Mr. Hughes said he would not have it made a condition of their acceptance, but a thing to be desired where practicable.

Mr. M'Lachlan gave some particulars of his efforts during the last few years to bring his proposal to a practical bearing, and spoke in very sanguine terms of the prospects of the movement.

The Chairman announced that Mr. Dunmore would, at the next meeting, read a paper on "The Organico-Iron Developer;" and, for the April Meeting, Messrs. Mayall and Joubert would prepare a paper on "Photographic Enamels."

The Meeting was then adjourned to Tuesday, March 13th.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The Glass Room and its Contents.

By H. P. Robinson[*].

The kindred subjects of glass houses and light and lighting have been almost worn threadbare; they have been amongst the principal attractions of several societies during the past year. In April Mr. Jabez Hughes read an admirable paper, "About light, and about lighting the sitter," at the South London Society, which was followed by a continuation of the question by another member of that Society, and in November Mr. Mayall stated his ideas on the subject to the Photographic Society of London. With all these gentlemen I, in the main, agree, differing only as to the arrangement of details; but there was a paper read before your own Society in March last by Mr. Sutton, on the glass room, containing such erroneous notions, such practically impossible theories, and so much assertion that everybody else was wrong and that the author alone was right, that I have felt bound, now that the season for glass-room building is commencing, as a photographer who has received many benefits from your Society, and who has had a very large experience in the use and building of photographic glass houses, to come forward and endeavour to point out some of the errors into which the writer of that paper has endeavoured to lead you. I also take occasion, by the way, to refer to the evil that is so often done by the dogmatism of theorists. In the present instance, I know of one case of ruin having resulted to a photographer from having endeavoured to erect a glass room according to instructions contained in the paper to which I have referred. The photographer to whom I allude scraped together enough money to build the house and purchase efficient apparatus, about £100; but when he commenced practice, he found his room was so imperfectly lighted that it was only on fine days and with long exposures he could obtain pictures at all, and these very unsatisfactory in quality. With every prospect of success he had to sell up because he could obtain no more capital to undo the mischief the paper read before your Society in March last had done him.

In three other instances, during the last year, I have superintended the demolition of tunnel-formed rooms, and have erected rooms in which good photography was possible in their stead. I have heard of other cases where photographers have been put to needless expense in trying the wild theories of this writer, but who have had to abandon them. The only room I know with any approach to this kind of construction in successful operation is Mr. Rejlander's, who has spent more than double its value on it in alterations, and it is now essentially different in principle from that advocated before your Society; moreover, Rejlander could take good and artistic pictures under disadvantages that would puzzle most other men.

Before describing what I consider as most desirable in a glass room, I will point out briefly two or three important errors in the form of that which I so strongly condemn.

It has no vertical light whatever, which every portraitist knows is a light under certain circumstances essentially necessary.

It has a large portion of front light, a light which always tends to flatten the picture and produce discomfort to the sitter.

It has a comparatively circumscribed side light, the most important light of all, and of which an extensive range, to be modified at will by blinds, is imperatively necessary.

The whole light admitted is so limited as to admit of no variation to suit different sitters by shutting out portions at some points, and letting in light at others.

The tunnel has a dreary dungeon-like aspect, depressing to the sitter as well as to the operator, and it is altogether unnecessary for the ostensible purpose for which it is paraded.

I will now describe the form of glass room which I believe to be most conducive to excellence of result, comfort, and elegance.

The shape should be a rectangle of the following proportions, 30 feet by 15 feet. It should have a ridge roof, 14 feet at the ridge, and between 8 and 9 feet at the eaves; each end should be quite opaque. If possible, it should stand east and west, the principal side light facing the north. From 6 to 7 feet from each end, side and roof should be opaque, the remaining portion of the north side and roof glazed with plain white glass. If the room be required for purposes of portraiture only, both roof and side facing the south may be rendered permanently opaque; but if it be required for occasional use in the production of artistic studies, portions of the roof and side facing the south may be also glazed as on the north side, but must be supplied with an excellent system of blinds, sufficient effectually to keep out the sun when not required, but possible to be removed for the purpose of taking sunlight effects when necessary. If all the opaque parts are built of brick and tile or wood, the room would be much cooler in summer and warmer in winter than if it were built throughout of glass. The proportions I have given are the extreme in size that will be desirable. The size of the glass room is of more importance than has been supposed. A very large room is decidedly objectionable; on the other hand, it is necessary to have a room sufficiently long to admit of the use of long-focus lenses, and to enable the operator to include a full-length figure.

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[*] Read at the Meeting, Feb. 13, 1866.

The appearance of the room is important: this has much to do with the expression of the sitter. Mr. Sutton recommends a tunnel partly for the singular reason that it would aid the expression. Now to my mind nothing can be more cheerless-looking than the interior of a tunnel, painted a dead black, roof, sides, and floor, as he recommends. I prefer that the room should have more the appearance of a moderately furnished drawing-room, light but not dazzling, such as you might expect your sitters are accustomed to. I do not know what kind of room Mr. Sutton's sitters were accustomed to; but I do not remember ever meeting one that had spent even so much as his leisure moments, to say nothing of his every-day life, in a tunnel; and in this I am supposing that our sitters are not all "navvies." It is bad enough to be taken to a strange place and be made to go through a strange operation without the additional discomfort of being taken into an uncomfortable room.

The shape and proportions I have indicated will permit of simple elegance of arrangement, and afford space for the proper disposal of accessories and the performance of all necessary operations without inconvenience.

As a general principle, violent contrasts of all kinds should be avoided in the furnishing of the glass room, everything being kept as quiet and harmonious as possible; light objects, bright objects, and indeed all surfaces casting accidental and uncontrolled reflexions, either on the sitter or into the camera, are better avoided. The wall paper should be simple and quiet in pattern, and of a warm grey in tone. The carpet should cover the entire floor, and should be well stretched and properly put down. A small pattern is best, without patches of white or light blue; a maroon ground with a pattern in brown and black answers admirably. The furniture should be solid and good, and as varied as possible, to enable the operator to obtain as much diversity in his pictures as possible. There should be a plain fixed background at each end, so that either side of a face may be taken with the north light. Extra backgrounds, pictorial or otherwise, should be at hand stretched on frames, running easily on castors, so that they may be rapidly changed without effort.

Using only the north light of this room, blinds will rarely be required; nevertheless, it would be desirable to be furnished with them to enable the operator to modify the direction and quantity of the light to suit special cases.

The subject of lighting the sitter has been so often treated, and treated as it only can be in general terms, that it is scarcely necessary for me to add any remarks on the subject. The special lighting of each sitter is, after all, a question which can only be solved by the operator when he has that sitter before him. He must see that the light and shade fall right before he produces a picture, and with the capacity of seeing this the power of modifying it is generally accompanied. As a general principle, however, a high side light, a little in advance of the sitter, is the most important direct light; excess of vertical light is in most cases to be avoided; nevertheless it may be useful at times in giving force and brilliancy to flat common-place faces, which in themselves possess very little relief. On the other hand, where the sitter has heavy brows, sunken eyes, or prominent features, the least possible vertical light should be employed, or these features will look the more marked and heavy. With such faces the side light, well in advance of the sitter, will give the most soft and harmonious effect without risk of flatness. The top front light will generally serve to illumine sufficiently the shadowed side of the face without the use of reflecting-screens, which may, however, under certain circumstances, for instance, when the face is turned away almost to a profile, be found useful. I may here remark, although not within my immediate province, that the constant use of white reflecting-screens which some operators, using only one side light, seem to think imperative, generally arises from the much too common tendency to under-exposure amongst portraitists. If photographers would be content to get harmony of light and shadow by a fair exposure rather than by reflecting-screens on the one hand and over-development on the other, much of the coarseness and hardness common in photographic portraits would disappear.

On the subject of ventilation I have not made any remarks, as it is chiefly a builder's question; I assume, however, that every photographer will feel its great importance; and above all would I urge it on those regularly engaged in operating to study the ventilation of the dark room, as an essential element in securing good pictures, as well as in securing and maintaining good health.

I have had the privilege of seeing the glass rooms of perhaps all the portraitists of any eminence in London, and a good many in the provinces; and whilst many of these are built upon plans rendered necessary by the exigencies of the positions in which they are placed, yet I have noticed, that all have been, either in fact or by continued modifications of arrangement, as nearly as possible adapted to the form I have described. In some cases, where a top light alone was possible, the operator has contrived to shut off, by means of blinds, all the light, except a small portion, at the most remote corner from the sitter, thus obtaining a high side light in advance of the sitter, and so produced beautiful effects.

If I have spoken somewhat plainly in the condemnation of the theoretical whims brought before you some months ago, it is because I have had very vivid evidence of their practical mischief. What I have advanced as my own conviction is the result of my own experience in taking many thousands of negatives, in which—I say it with all modesty—I have not been entirely unsuccessful. That experience is confirmed by a somewhat intimate association with the majority of the most able photographers of the day, whose practice indorses my remarks. I may further add that I have the highest respect for the theories of the thoughtful scientific men in our art, and am happy also to add that I am confirmed in my practical views by consultation with them on theoretical considerations. If I needed to go further for authority to confirm my own practice, need I do more than appeal—and I cannot help feeling pride in doing so—to the seven medals with which your Society has honoured my poor efforts at various times.

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The Exhibition of the Photographic Society of Scotland.

The Council of the Photographic Society of Scotland have decided to hold a Competitive Exhibition this year, and they offer the following Medals for competition:—

For the Best View, taken by a Dry Process: the details of the process to be communicated to the Society.

For the Best View, taken by an Amateur, by any Process.

For the Best Portrait.

For the Best Enlargement (View or Architectural Subject).

For the Best Enlargement of a Portrait.

Enlargements must be superficially at least four times the size of the original Picture.

The Council to have the power of awarding extra Medals for any Picture of sufficient merit which may not have been included in the above List.

All the Pictures must be untouched, and from single Negatives, except in the case of Views, which may have the Sky Printed from another Negative, or they may be Toned or Shaded before Fixing.

Photographs (framed) to be forwarded to 117 George Street, on or before the 1st of March 1866.

A capital Exhibition is anticipated, the Medal of this Society being one of the most coveted prizes a photographer could possess.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The usual Monthly Meeting of this Association was held at Myddelton Hall, Islington, on Wednesday, February 7th. Mr. Hislop in the Chair.

Mr. Barnett, the Hon. Sec., read the Minutes of the last Meeting, which were confirmed.

Mr. Edward Dunmore, of Malden Road, Kentish Town, and Mr. R. L. Allan, of Murray Street, Camden Town, were elected by ballot Members of the Association.

The Chairman laid on the table some circulars received from Mr. McLachlan, Honorary Curator of the Manchester Corporation Photographic Museum, on the subject of the establishment of national and local galleries or museums under corporate or other authority and control, for the systematic collection and preservation of authenticated photographs of distinguished individuals. He also directed attention to some beautiful proofs printed by Mawson and Swan's carbon process, and to some large pictures taken by Ross's non-distorting ordinary-angle actinic double lens. Some of these prints were taken with the new doublet 9-inch, and others with 11½-inch, equivalent focus.

The Chair was then taken, *pro tem.*, by Mr. Simpson, and Mr. Hislop read the following remarks:—

A Word for Sugar in the Iron Developer.

An animated discussion is now occupying the attention of photographers, both amateur and professional, with respect to the merits of gelatine as employed in the collodion developer. Some gentlemen pronounce it to be the long-desired and infallible producer of good pictures, while others say it is of no use. A third party comes in and tells you, that if you already get good pictures, and do not desire any improvement, why then do not try the new developer.

Now, sir, as one of this class—or rather, I ought to say, as one who is tolerably satisfied, not with my own manipulation, but with the effects which may be properly set down to the compounds I employ—I do not quite acquiesce in the philosophical correctness of the last recommendation. I am not (perhaps to my own loss) one of the "Rest and be thankful" class in photography, or in any other science, and therefore do not like to be excluded from possible excellence because of present partial success.

Moreover, I think the proper way would be to inquire why some get good pictures by ordinary development, and others do not. Having ascertained this point, we may then observe if a new developer will improve matters; if not, we are in a better position to pronounce on its value.

I am not now about to enter into an analysis of the question of intensity. The conditions are known to every careful photographer. We know how the state of the bath and collodion influence intensity, and how it is possible to get both weak and strong pictures with the same developer by a slight modification of the condition of the bath, or of the conditions of exposure. We also know how diffused light in the dark room, and more especially in the camera, will lower intensity by producing fog.

In passing, I would just advert to an abomination which some camera-makers perpetrate in their dark frames. Our lens-mountings and camera bodies are generally carefully covered with a dead black on all sides, so that no rays except those required may be reflected on to the plate, and yet when you open the dark (?) frame, you often find the wood left of its natural colour, and, worse still, sometimes varnished or polished, so as to give it a smooth and light surface. One of these surfaces is close to the back of the plate, and unless the film is absolutely opake, the light which passes through at different angles in different parts must necessarily, after impinging on this bright or light-coloured surface, become diffused in all directions. You cannot now keep your developer on long enough to get sufficient intensity; the shadows fog; and as soon as this begins, all further development only increases the difficulty of printing, without increasing the vigour or contrast of the picture one whit.

To any amateur troubled with fogging or want of intensity, I would say, first look at your dark frame. If you have a light-coloured back to it, reflecting light in all directions, just lay a piece of black velvet over it, and then try a picture or two, and if your chemicals are not in fault, you will not be troubled with fog or want of contrast.

But to return to developers. I am about to draw down a heavy censure upon my devoted head. I am going to ask Members to try back, and use an agent suggested long ago, but apparently now forgotten or neglected. It is sugar—simple loaf-sugar—and nothing more. I do not think it of much use to give formulæ, as these must be varied to circumstances; but I may observe that I chiefly use a 15- or 20-grain solution of protosulphate of iron, with not less than 50 grains of loaf-sugar. No alcohol is required, and very little restraining acid. In fact an old solution of protosulphate of iron which has turned brown may be used where great intensity is not required, for I find that acetic acid judiciously employed generally increases the intensity of detail. I have employed a definite compound known as the saccharo-sulphate of iron; but as the solution requires the addition of more sugar to make it slightly viscid, I prefer the simpler method of using protosulphate, and adding the quantity of sugar which I find by experiment to meet the condition of my bath and collodion.

The solution may be used as an intensifier with a second dose of nitrate, and then no loss of half-tone. Sugar may be obtained anywhere; there is no danger or difficulty in the preparation; and there is no uncertainty as to the restraining power of the agent employed, as appears to be the case with other substances.

Honey and treacle have also been suggested for a similar purpose, and will no doubt answer that purpose; but, from the fact that these compounds are not absolutely uniform in various samples, their use is not so convenient or certain as that of the simpler substance, the employment of which I advocate.

Mr. Hislop exhibited some specimens of working with the new developer. They were not, he said, so satisfactory as he could wish, having been taken in dark weather. The time of exposure was twelve seconds, and they were developed in iron and sugar.

Mr. **Allan** said he was one of those who had been unsuccessful in the use of the gelatino-iron developer. He knew that other photographers had been successful with it, and he had seen specimens of their work which quite removed all doubt that, under some circumstances, beautiful pictures might be produced by it; but the want of uniformity of result made professional men leave it off.

The **Chairman** said the special point which Mr. Hislop had endeavoured to impress upon the minds of the Members was, that they possessed in an old agent, recommended many years ago, viz. sugar, an element which gave all the advantages so much discussed in regard to the use of gelatine.

Mr. **Dunmore** exhibited some beautiful pictures developed with the gelatino-iron developer without any intensifying; also a negative which had been cut in half, and one portion developed with ordinary iron, and the other with the gelatino-iron developer. He remarked that for portraiture, when a good light could be obtained, he thought the ordinary developer was to be preferred.

Mr. **Martin**, in support of the recommendation of Mr. Hislop to use sugar in the place of gelatine, said he was desirous to remind the Members of one advantage not yet referred to which the former possessed, viz. definiteness of character as a crystalizable body. Gelatine, as was well known in commerce, existed in different hygro-metric conditions; it would absorb moisture with great readiness, and in so far as it had a tendency to do that it was interior in value to sugar, which also crystallized regularly. He thought it should be the aim of photographers to employ as much as possible compounds of that character. By so doing many of the discrepancies which now existed in the results achieved by the same process would be avoided.

Mr. **Bockett** referred to another formula which, he said, was anything but new, viz. ordinary protosulphate of iron, glacial acetic acid, and glycerine. The results obtained with glycerine were very similar to those obtained with gelatine, and identical with those obtained by the use of sugar. He mentioned this because it seemed to him that, instead of finding out a new thing, they were going back to the old. Certainly with glycerine great intensity could be secured. Recently he had had put into his hands a formula which consisted of glacial acetic acid, formic acid, and glycerine, by which good results could be secured with little exposure; but even this, he thought, was not new. With regard to gelatine, he confessed that the more he used it, whether it arose from the influence the cold weather had upon it or not he could not say, the less favourably was he disposed towards it.

The **Chairman** said glycerine was an agent he had frequently used, and he found it had many of the advantages claimed for the general viscous developers; but it had this disadvantage, that it was decomposed by the slightest trace of free nitric acid; and as this acid was frequently used in baths, and as in prolonged development there was nitric acid evolved by the silver thrown down, obstacles were presented to its use. With respect to formic acid, it had been mentioned repeatedly of late as possessing special value in connexion with the organico-iron developer, as tending to shorten the time of exposure, and also producing greater delicacy. As far as the results produced by Mr. Hislop and Mr. Dunmore in the charming pictures now exhibited might guide them, there was sufficient to justify all that had been said on behalf of each developer. The choice between them, therefore, must rest on other considerations than the excellence of results. Probably, and that must be proved by practice, if it could be shown that the addition of sugar, in all cases, would produce the same effect as gelatine, it would be the more desirable agent. It was a compound of more definite character, and was always more readily accessible; and should experience prove that the result might be depended upon with equal certainty and uniformity, it would have a decided advantage.

Mr. **Hislop** having resumed the Chair,

Mr. **Frank Haes** read a paper in which he gave the results of his experience in photographing some of the animals in the Zoological Gardens:—

Photography in the Zoological Gardens.

In laying before you this evening an account of mishaps and misadventures I had in photographing the second series of the wild and tame animals at the Zoological Gardens during the past summer, I am sure that I shall not be able to present anything new in a photographic point of view. It was rather late in the season when I commenced working at the Gardens, in which, thanks to the kindness of the Society and its able officers, every possible facility was, as before, afforded me.

I was desirous of trying to photograph some of the horses at the Islington Horse Show, for which I had received the kind permission of the Secretary, and have now the pleasure of showing you portraits of several of the winners of the prizes there, amongst others that of "Caractacus," who won the Derby in 1862, and who has for two years taken the first prize at Islington for racing stallions. These horses were very difficult to photograph, for the confusion and excitement caused by the noise and the presence of so many persons, and horses of course, made these stallions very irritable. "Caractacus" was more troublesome than any; for his groom, thinking he knew better than I did in what position I required the horse, would, just as the animal was quiet, jerk on the leading rein, and so startle and annoy this fine creature, that several times, after having everything quite ready for exposure, I had to snatch up the camera and run, as I saw on the ground glass a sort of phantasmagoria of the horse getting larger and larger. The owner of another prize horse, "Motley," which I was anxious to take, as being the only living stallion of the famous "Touchstone" breed, tried a still more novel way of inducing the animal to be quiet, by striking him on the nose with a roll of paper which he had in his hand; of course the result was, as you may well imagine, an absolute failure, in spite of several attempts and requests not to persist in this treatment. The celebrated American trotter "Shepherd" (F. Knapp) was much less trouble, and I soon had two negatives of him. The premises of the Agricultural Hall are certainly not adapted for photography, and the light is not sufficiently good for rapid working in such a densely-populated part of London; besides which, the weather during the whole of the week was very unfavourable, as it rained almost every day.

The Horse Show over, I removed to the Zoological Gardens. I worked with the same lenses and camera as last time, using also the same collodion (Rouch's ordinary bromo-iodized) and the same formulæ for the chemicals; but in one respect I had a great advantage. I last year used Smartt's tent, and, as you may perhaps remember, it was blown over on a windy day, when of course everything was broken, and the whole of a fine 88-oz. bath was sucked up by the earth. This year I used one of Messrs. Murray and Heath's new tent boxes, which is here, this evening, and which, as far as I can judge, is all that can be desired; it contains everything except the tripods, and I have used it for hours exposed to the full rays of the sun, though of course this is not advisable. Not being satisfied last season with the Sœhnée varnish, I this time used Thomas's —which is much harder—varnishing every negative twice, in the manner recommended by Mr. G. Wilson: I have found that the negatives thus protected suffer less in printing from contact with the silver paper.

I shall now proceed to describe the slides, which I will take in their order from No. 1. The Chimpanzee, the late Miss Sarah, was not as good tempered as the Orang Outang, and I had a great deal of trouble in persuading her to be quiet; however, by dint of perseverance, I succeeded in getting three negatives.

To make my series more complete, I now wanted a specimen of the Monkey tribe, and we tried several of the best-tempered ones in the collection; but I was never more baffled in my life, for all these creatures had a decided objection to my taking a portrait of their faces. They often allowed me to focus and put in the plate, and when just ready, round would turn the monkey, giving me a very fine view of everything except what I desired. In fact, I had to give it up, but think I could manage a tame one, which was accustomed to be handled.

The ruffled Lemur was very little trouble, but it does not make a nice picture, as the keeper was obliged to hold its head to keep it quiet.

The next on the list, the Aye-Aye of Madagascar, is very rare and curious. Very few visitors to the Gardens see this, the only living specimen in Europe, as it is a nocturnal animal. There was no way of focussing it but by marks on the box in which it was placed for me; because if the lid had been opened, it would immediately have covered itself with its beautiful bushy tail. When quite ready, the lid was suddenly lifted, and it was photographed before it had time to think about the sudden glare of light in which it found itself. Although I tried several times, I only obtained one negative; all the others were useless.

A very fine Bat, which hangs all day quietly in its cage, I purposed making my next subject. With this intention it was removed into a birdcage, and left some hours to become accustomed to the change. I then prepared to photograph it, but was obliged to relinquish it, as the animal was constantly clambering over the wires.

The handsome clouded Tiger was my next; and as I knew that at a regular time, any fine warm day, I should find him sunning himself on the branches in his enclosure, I did not need any particular precaution. This photograph, and several of the following ones, are much spoilt from the effect of the bars, which are very small and close; and the doors were so placed that they could not be opened, neither was there room enough in the enclosure for me to go inside with the animals.

The photograph of the Binturing is a failure, not from the animal moving, but from the bars. It is a sulky brute, and gave some hours' work, besides biting the keeper.

The Esquimaux Dog was given to the Society by Lord Dundreary. It is said he is the only survivor of a number used in one of the Arctic exploring expeditions in search of Sir John Franklin. This is a fine animal and of immense strength; his temper is none of the best. Coming from such a cold country, he did not care about our warm summer, and panted heavily. I made many attempts, and at last had to be satisfied with but an indifferent picture.

The Dingo looks in the photograph just like what it really is, a great cur. They are powerful animals, and a pest in Australia. When in the bush, I have heard their horrid yelling night after night. They hunt in packs, and are a great nuisance to the squatters.

The Ratels must be well known to almost all visitors at the Gardens, as one of them is always walking round a circle it has made for itself, and at a certain spot throws (in passing) a somersault, and then continues its peregrinations. I have watched it for a long time, and it has never failed to go head over heels with the greatest care at the same spot, just as if it were performing some important duty. These are not easy animals to handle, for they bite most severely. We trapped one into a cage, but without the stereoscope you cannot make out much of the details. The back is quite white, and the other part of the body black, all of which increases the photographic difficulties.

I may here remark that it is somewhat singular how few animals are of a colour favourable for photography; various shades of yellow and red seem to prevail; and even brightly-plumaged birds are but poorly rendered in the present state of our knowledge of this scientific art.

The next in my list is the Tasmanian Devil, and well he deserves his name, for a worse-tempered brute it would be difficult to find; he came at us open-mouthed, and, notwithstanding repeated repulses, was always ready to charge. We had to be careful that he did not succeed in biting us, for he holds with bulldog tenacity. After tiring him well out, the keeper skilfully and quickly lifted him up on a hutch, on which he remained quiet long enough for my purpose.

The Coypu Rat I shall only mention to say that here again the rails in front quite spoil my photograph, although the animal was quiet.

The pretty little Prairie Dog, or Marmot, was an agreeable change, giving no trouble; so I will pass it over for—

The Leucoryx, a fine specimen of the antelope tribe, and, like all of this kind, so restless and suspicious of any unusual sight, that it was some time before it was even advisable to prepare a plate; even the keeper despaired of ever having a picture of it. The great difficulty with all these animals is, that they will face the camera and watch your every movement until attracted by something still more novel.

In photographing large animals it should always be remembered that a mere (so to say) elevation, or perfect side view, will never do justice to the real form; and it is principally in the form that the great beauty of the lower order of animals is found; so it is always worth a great deal of trouble to get the creature to stand so as to show all four feet distinctly; this is easily seen by referring to the various stereograms now before you.

The Addax, another antelope, was not much trouble. Not so, however, the common Gnov, which is a young animal only lately arrived here, and has not yet learnt all the wicked ways of his predecessor, who was last summer sent to Holland in exchange for other animals. I went into his enclosure, and, although he wanted to run all round it, three of us managed to gradually confine him in a corner. Whilst engaged on this subject I was much annoyed by persons passing, who, seeing what I was doing, would stop, and either feed the Gnov or tease him with their sticks through the rails.

The Blessbok was very troublesome, and as the particular part of its enclosure which it affects is shaded by a tree, I found that I could do best by selecting a time when the sun was obscured. As you see him he is watching some leaves held by his keeper.

The Goats now claim our attention, commencing with the Ibex, which is a very fine specimen. He was chained up, as he has an unpleasant habit of butting very powerfully, although not so dangerous as the Markhow or Snake-eating Goat of India. This was an old favourite at the Gardens, where he lived about ten years. It is likely to be some time before the Society acquires another such fine specimen, as they are as wary and as fleet as any known animal, and are only killed by the exercise of the greatest skill in stalking. Before cooking you have first to catch it, says the old proverb; and never better illustrated than with our friend here, for the keeper could not venture into his yard until he was fastened up; for this purpose, it always wore a strong collar, and, when necessary to catch him, the keeper brought a handful of wheat and called him, having a heavy chain on the ground in readiness; the knowing fellow would come, eat the corn out of his hand, and watch, with one eye on the corn and the other eye on the other hand, with which the keeper would endeavour to seize his beard. This, by the way, is a goat's weak point: always seize the beard if you want to master one. Very often this game would go on for an hour or more; sometimes the keeper would succeed at once. As soon as he had the beard in his hand, the chain was fastened to the collar, all this being done through the bars; he was then chained up, and my troubles were soon over. But this preliminary exercise did not do much to improve the hand for the requisite steadiness in working; and, as I generally found the hotter the day the better the picture I could produce, you will believe that after five hours daily of this hard work I was usually very tired. If it had not been for the annoyance and unfeeling interruption of the visitors, I should have been able to photograph the Markhow in the same position as the next one, which is the Cretan Goat.

The Deer are almost as nervous as the Antelopes. The one now before you, the Formosan Deer, is a beautiful creature. I was anxious to take the splendid Axis Deer; but it was impossible, as, if I had attempted to take the camera inside, there was every reason to believe that it would have leapt on the roof of the shed; and this could not be risked. Péron's Deer is not a very attractive animal. The next is rather a curiosity, being born in the Gardens, and only four days old when I photographed the pretty timid thing.

[To be continued.]

A number of stereoscopic pictures of these animals were produced, and at the close of the sitting Mr. Haes exhibited a most interesting series of magic-lantern slides, which were very greatly admired.

Messrs. **Murray** and **Heath** exhibited their improved box tent.

Votes of thanks to Mr. Hislop and to Mr. Haes were very cordially adopted, and the nomination of officers for the ensuing year took place.

Mr. **Barnett** asked to be allowed to resign the office of Hon. Sec., having served the Association for several years, and his health now being far from good.

The **Chairman** said the Association could ill afford to lose the services of Mr. Barnett, and he suggested that an arrangement might be made with one of the Members to render assistance to the Hon. Sec. in case of need.

Mr. **Bockett** kindly promised to act upon the suggestion, and with this understanding Mr. Barnett consented to retain office.

The proceedings then terminated.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A **Council** Meeting was held at 12, York Place Portman Square, the Right Honourable the Viscount Ranelagh in the Chair. The Minutes of the last Meeting having been read and confirmed, the following Members and Subscribers were proposed and elected:—

Rev. J. R. Valpy.
Col. G. Halpin.
Mr. J. C. Ryle.
E. Willmot, Esq.
W. S. Shirras, Esq.
J. H. Sclater, Esq.
L. Ashbrum, Esq.
W. Green, Esq.
Miss Banks.
H. Smith, Esq.
Joseph Guyton, Esq.
John L. Riley, Esq.
J. A. Jobling, Esq.
F. P. Barlow, Esq.
Lord Clermont.

The Secretary then laid before the Meeting mounted copies of all the prize pictures, together with the prizes for each. They consisted of eight silver goblets, six very large and handsome albums with silver name- and inscription-plates, and seven similar albums of smaller size, making altogether upwards of seventy pounds' worth of prizes awarded for this year's pictures. The Council expressed their unqualified approval of the prizes, especially the larger albums, which were much admired.

The Secretary then read a long letter from Captain G. Bankart, drawing the attention of the Council to the inconvenience of calling for the Society's negatives early in the summer, and suggesting that they should rather be called for in the autumn of the year, as much more convenient to Members. It was, however, decided by the Meeting, after a discussion which occupied a considerable time, in which Captain Bankart's arguments were carefully weighed, that whilst admitting that there were many serious inconveniences attending the present arrangements, still more would result from the change recommended, owing to the great difficulty of printing from the negatives during the winter months; the Secretary moreover stated that already Captain Bankart's wishes were met halfway, as although the negatives were asked for by the 1st of June, the list was in reality kept open until the end of July. The Secretary was directed to reply to Captain Bankart in accordance with the decision of the Council.

The Secretary then laid before the Meeting the certificates of honourable mention which had been awarded, and they were signed by the Chairman.

The proceedings then terminated.

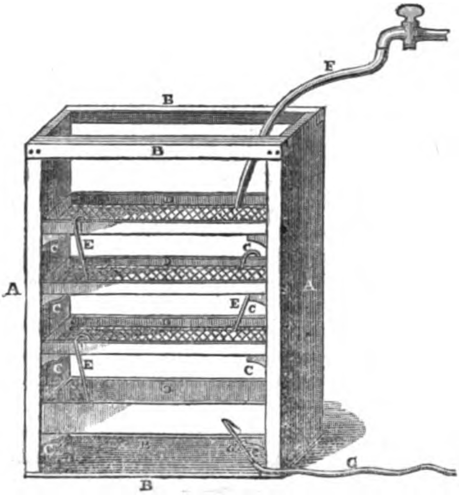
A. J. **Melhuish**, *Hon. Sec.*

A Method of constructing a cheap and effectual Washing-Apparatus for Prints. By E. Dunmore.

A **method** for thoroughly washing prints, easily constructed and of little expense, adapted for photographers having a limited number of prints or a small supply of water, the following construction is designed:—

The materials required are, a few pieces of board, nails, glass, india-rubber tubing, galvanized-wire netting, and shellac varnish. Two pieces of board, A, A, are joined firmly at the top and bottom by cross bars, B B, B B. Strips of wood, C, C, C, C, are fastened at intervals upon the inside of the boards A, A, to form supports for the wooden dishes D, D, D, D, which are made of wood, with strips of the same nailed round the edges of the upper surface, and varnished water-tight by the shellac varnish, and about 2 inches deep; each dish is connected with the one below it by means of a glass tube, bent to form a siphon, E, E, E, E. On the bottom of each dish a piece of the galvanized-wire netting is placed, a little curved upwards, in the centre.

The *modus operandi* is, first, to connect the elastic tube, F, with the water-tap, and the lower one, G, with the drain, or wherever the waste is required to be conducted. This being done, fill each dish with water, and place the prints to be washed above the wire net in each dish; see that the siphons act properly, then turn on the water. The wire net will prevent the prints sticking to the sides or bottom of the dish, and the siphon will remove the contaminated water from under the prints, securing a current of fresh water through the whole series of dishes. It will be seen upon referring to the diagram that the lowest dish is deeper than the others, and the siphon passes through the side, into which it is cemented; this is merely for the sake of avoiding wet and dirt in the place where it may be used. The size and number of the dishes may be varied at pleasure, each being independent of the other. The current of water can, of course, be regulated by the size of the siphons, which, it is needless to remark, must be of exactly the same size, the supply of water from the tap being kept equal to the discharge from the waste-pipe. When once started, it requires no attention until the operation of washing has been continued sufficiently long, the wire preventing the prints sticking, or the siphons from being clogged, &c.



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On the behaviour of Iodide of Silver when exposed to light either alone or in contact with an aqueous solution of Nitrate of Silver, or with one of Ferrocyanide of Potassium. By Dr. W. Reissig.

The more important results of the investigation made on this subject are as follows:—

1. An absolutely pure iodide of silver may be prepared by dissolving the compound which has been precipitated from iodide of potassium, and which contains traces of chlorine and bromine, in excess of a concentrated solution of iodide of potassium free from iodic acid, reprecipitation of this solution by much water, and copious washing.

2. Pure iodide of silver is not chemically changed by light; yet the compound in an exceedingly fine state of division does undergo a molecular change, when (in a layer of collodion) it is exposed for a lengthened time. Thermal influences predominate in this case.

3. A remarkable deportment is exhibited by the iodide of silver, which is produced by the direct union of metallic silver and iodine, when the former, in an exceedingly fine state of division, is in a layer of collodion upon a glass plate.

If the metallic silver in such a layer is not completely changed into iodide of silver, that is there is metallic silver along with AgI, by continuous exposure of such a plate under a negative a visible picture is obtained without further treatment; with a shorter exposure the invisible impression may be rendered visible by mercurial vapours just as in the daguerreotype process.

The formation of these pictures (AgI) might be explained by supposing that iodide of silver, when exposed in contact with metallic silver, separates iodine, which is taken up by silver while Ag_2I is formed.

A glass plate coated with metallic silver contained in collodion, the silver of which is completely changed into iodide of silver by a concentrated solution of iodine in iodide of potassium, exhibits, on lengthened exposure, luminous impressions resulting from molecular changes. A separation of iodine could only be seen in one case, in which castor oil was added to the collodion.

4. If an aqueous solution of absolutely pure nitrate of silver is exposed to the light it exhibits *no* chemical change whatever, either in dilute or concentrated solutions, contrary to what is maintained by some authors.

5. If a collodion plate impregnated with iodide of silver is kept moist under a silver solution, which is not too moist (containing 5–10 p. c.), and is exposed to the light for a sufficient length of time, by the aid of an ob-

ject-glass a distinct visible image appears, as I observed for the first time.

6. If pure (*vid. sup.*) iodide of silver is continuously exposed under dilute solutions of $AgO\ NO_5$ (about 8–12 p.c.) iodine is separated, which precipitates iodide of silver, while nitric acid and oxygen are set free. Iodic acid is not formed in this process. The iodide of silver acted upon by light is changed into a lower compound of iodine and silver—in $Ag_2 I$, probably. Free metallic silver could not be detected in it. It agrees in all its properties with the compound which, as Dr. Vogel has shown, is obtained when iodide of potassium acts on chloride of silver.

7. On a short exposure of $Ag\ I$ under the above conditions a chemical decomposition is not perceptible, although highly probable.

8. Exposed under a completely saturated solution of $AgO\ NO_5$, AgI separates a reddish substance extremely like iodine. This body is probably a periodide of silver.

Brought in contact with water or aqueous solutions, it at once separates iodine, which immediately precipitates yellow iodide of silver, with liberation of nitric acid from the adherent nitrate of silver. Exposed to direct sunlight under the solution of nitrate of silver, it decomposes this solution, forming yellow iodide of silver, nitric acid, and oxygen; in diffused light no change ensues.

9. If pure iodide of silver is exposed under a solution of ferrocyanide of potassium, an almost immediate separation of iodine ensues; for, on the one hand, iodide of silver, on the other iodide of potassium and ferrocyanide of potassium are formed.

10. The action of light on a collodion-iodide-of-silver plate which is covered by solution of ferrocyanide of potassium, is manifested by an image which appears more or less rapidly, according to the intensity of the light, and which, for practical photographic purposes, affords a comparative measure of the intensity of light. In like manner, after a very short exposure of a plate prepared as above described, negatives may be prepared, if the ferrocyanide is removed from the plate, and a solution of nitrate of silver, or of nitrate of silver mixed with sulphate of iron, or with pyrogallic acid, is poured on the plate.—*Proceedings of the Imperial Academy of Sciences in Vienna,* Dec. 7, 1865.

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THE EXETER GRAPHIC SOCIETY.

On Photographic Portraiture. By Dr. Scott.

[Continued from p. 250.]

Our next point is the distortion of the features. A very common error even in photographic portraits is that the prominent features, such as the nose, the lips, the chin, and the hands and feet, are out of all proportion to the other parts of the figure, they are larger than they should be: this distortion is chiefly produced by a desire to get larger pictures combined with the want of a proper appreciation of the powers of the lens. There is always a desire in sitters to have their portrait as large as possible, and it is when we see portraits taken large that we have the greatest faults as respects the distortion of the image. The truth is, when we focus a face in the camera, we are only mathematically correct for one plane of that face, whereas you know that no face is a plane. If we focus for the eyes, the nose will be in front, and the ears behind our true focus, and both therefore will be untrue, or suffer from distortion. As we augment the size of our pictures we make these errors more apparent, till we see in some large heads, visages that hardly appear human.

In taking photographs, the first requisite of a successful picture is perfect stillness. Unless we have this we get a confused mass of meaningless shadow. But living objects have always great difficulty in remaining perfectly still for any length of time, and, indeed, before people were required to sit for their portraits they hardly knew what perfect stillness meant. To get this stillness then is the first object, but to get this the sitting must be very short, and to get our portrait in a short sitting we must have a rapid action with our chemicals, and a lens of a short focus. Now a short focussed lens is only another word for a small picture, for the size of the field which the lens will cover satisfactorily, is in proportion to its focal length; and the proportion which the one bears to the other is about that of six to ten, or, in other words, a lens with a focus of ten inches will cover a field of six inches square. But ten inches is a long focus for portraiture, the length of focus here seldom being for them four or five inches, which you see will give you a picture not very large. To get rapid action also and increased size, we bring the sitter near to the lens, which is another means of increasing the distortion of the image to a very considerable extent. Hunt says "for portraiture and all purposes requiring great distinctness of outline and rapidity of operation, two achromatic lenses are usually employed. By this arrangement the focal distance is diminished, and the image much reduced in size," but even then, he adds, "though the distortion is not so much as has been occasionally represented, it may, by careful examination, be discovered in the finest photographic portraits to a greater or less extent." Let not then those who seek to have portraits by this method require them of a large size. The larger they are taken they will be generally found to be less satisfactory.

Our next consideration will be to look at them as works of art, and here perhaps, we have the most cause for complaint, inasmuch as we seldom look at a portrait, where pictorial effect is attempted, that we do not find violations of well-established principles of art. It is from there being little or no artistic effect attempted in vignettes, that we find them so frequently the most agreeable pictures, and as it is easier to get a good and satisfactory vignette than to get a good full-length portrait in photography, it would be perhaps desirable that this kind of portrait should be preferred. In a surface so small as that of a carte de visite, the mere treatment of features is not of great importance. It is in the composition of the picture, or the collocation of the several objects in the work both relating to each other and with respect to the whole, that the chief faults of photographs are to be found. These errors are seen not only in the size and distribution of the masses, but also in the want of chiaroscuro, so important in giving life and vigour to pictures which have mere light and shade to depend upon, and in the entire want of subordination amongst the different parts. In a photographic portrait the chief object to be given, and to which all others ought to be subservient, is the face; there we ought to concentrate all our interest, and place it, of course, in the most agreeable light and shade. Its being near to or far from the top of the picture will give the sitter height or shortness, and this ought to be always attended to, if we are desirous of giving a good impress of our subject as a whole. Then we should allow no object to be introduced that is likely to interfere with this height; such objects as give lines crossing the figure directly at right angles, such as that stock piece of photographic furniture, a balcony. I never see this balcony but it reminds me of a story of a sign-painter, who, though his range of subjects was limited, yet excelled in painting one thing, viz., a red lion. Whenever he was sent to paint a sign, whatever the landlord or his better half proposed, the artist was sure to talk them round to a *red lion*. This was the true sign for a British landlord to have; so it is with the photographs.

A portrait itself is something sentimental. It is often a love-gift; and what so suggestive of moonlight nights, soft sighs, sentimental serenades, and stolen kisses, as a balcony? So we have a balcony in all possible forms, and under all possible conditions.

Another object which constantly meets our eye is a Greek column, or something that is intended for such; this is introduced into all manner of interiors, for what purposes one cannot possibly imagine, or to what particular order it belongs it is difficult to tell; perhaps some of our architectural friends might tell. Then the high backed, profusely carved chair is another piece of furniture in great request, and these chairs show their legs to such an extent, and with such ostentatious obtrusiveness, that one gets to feel with the American ladies, the indelicacy of the exposure, and feels tempted to have the artist prosecuted for indecency. In fact, it often becomes a question, whether or not the artist intended to give the portraits of balconies, columns, and chair-legs, the sitter being merely an auxiliary, so prominent are these made, thus violating entirely that subordination of parts to which I have already alluded as being a necessary feature in good artistic composition. The mistake appears to be that many persons think it possible to make a picture more pleasing and impressive by filling it with beautiful objects, but this is not the case; the truth is that such a mode destroys the effect of a picture. Were the materials of twenty pictures crammed into one, it would entirely fail in producing any great impression as a whole, because the value of the separate parts distracts and divides the attention, till at last it can hardly feel affected by any. This is true in all art, and how much more so is it in a photograph of the kind we are speaking of, will be easily felt when we only just consider the smallness of our surface and the limitation of our materials. The truth is, that the less extraneous matter put into a portrait of this kind the better; a plain back-ground of good tint, leaving the head to depend upon itself, will be far oftener a successful portrait than when it is to be helped by such auxiliaries as bookcases, pillars, balconies, or high-backed chairs, carved though they be ever so elaborately.

There is another point of composition besides the distribution of the objects introduced, on which depends very much the effect, pleasing or otherwise, which a picture produces, and that is its light and shade. And here we see very little successful treatment in photographic portraiture. It is from the due amount and proper distribution of light being of so much importance in producing a pleasing picture that the dress of the sitter, chemically considered, should be so carefully selected, and which I have referred to in the earlier portion of my paper: because, however carefully a man may arrange his sitter, and however good the composition may be in light and shade, when the natural colour of the clothes are viewed, it is quite another thing as to how "they may come out" in the picture. Say we have a black coat and grey trowsers on a man; these make not a bad combination in the natural colours, the lights of the coat go into the shades of the trowsers, while the mass of the latter gives us a good mass of middle tint, and hence we have a breadth of effect that produces a pleasing oneness in the whole. But does this come out so under the lens? Certainly not, especially when we are to consider the chemical action required for the face. We get the coat of dead black surface without texture at all, and the trowsers almost white, especially if the grey has an excess of bluish tinge; hence we have a violent contrast, leaving all the lines of each hard and cutting, and the mass of light generally overpowering the face altogether. The mass of dark, as far as I have been able to observe, should be kept toward the bottom of the picture. It should gradually creep down on one side, perhaps at the back of the figure is best, and massing itself towards the lower part of the sitter, place the feet and legs in such shadow as will prevent them appearing so defined as if they were carved in mahogany. This arrangement, however, no doubt may be varied with good effect, and it is the duty of the artist to so study his art, as to become acquainted with all the varieties of light and shade that may be advantageously introduced. The background should be of an even tint, and lighter towards the top. A curtain is often seen hanging down one side, and this is not a bad arrangement if all pattern be destroyed and no hard outline allowed to form a long line against the background; it may also be made useful in bringing the figure into the background, to prevent the hardness, when all the outline is distinctly traceable. You never see a picture from the easel of a great master where every part of the figure stands forth in marked outline from the background. The truth is, that by such a plan you cannot get roundness, not even when colour is used; when a picture is painted in such a manner it looks like a figure cut out in paper and stuck on to the background, and such an effect is very often visible in photographs, arising from the treatment we complain of. Again, the spottiness produced by white handkerchiefs, collars, cuffs, &c., is an evil of the worst kind, and prevents entirely any fine artistic feeling getting into the picture. We have very little room indeed in a *carte-de-visite* portrait to do more than give a pleasing and simple impress of our sitter, and the quieter we keep our picture in every respect the better, and I believe we can only do so by endeavouring as much as possible to avoid the errors I have spoken of—we avoid them entirely in vignettes, and here we never get anything that is painful or disagreeable to the best educated artistic eye, if we avoid making them so large as to give the features distorted. I have now noticed, as far as time and the occasion permit, the chief faults I have to find with photographic portraits, and I have not brought forward these shortcomings of photographers in a fault-finding spirit, but because I feel that if sitters had some better knowledge themselves of the capabilities and the limits of the art, they would not be so desirous of seeking from photographs what cannot be satisfactorily given, but content themselves with what the art can bestow both to their own satisfaction and the credit of the operator. One consolation however remains that applies even to the worst representations of a sitter, the deformities will not be perpetuated through all time, nor indeed for any long period, from ten to twenty years will see the end of most of them; for further experience has only convinced me more and more that what I stated years ago before this society is true, that photographs as at present taken will fade, and that after ten years signs of decay are generally too apparent.

A discussion ensued, in the course of which several members spoke to the fact of photographs fading away after having been kept ten years or more, and one or two members mentioned that photographs in their possession for that period were now as clear as they were when first purchased.

To Dr. Scott a cordial vote of thanks for his able paper was accorded.

On the Importance of Art-culture to Photographers. By Valentine Blanchard.

[Continued from p. 248.]

Now the distinctive features in each of the two pictures we have named, and which constitute the main force, and give to each the greatest power, are due to the right use of the art-knowledge acquired by the artists we have mentioned. Now hear what a thoughtful writer has said on subjects strictly bearing on our present remarks. Ruskin says, "Great art dwells on all that is beautiful; but false art omits or changes all that is ugly. Great art accepts Nature as she is, but directs the eyes and thoughts to what is most perfect in her; false art saves itself the trouble of selection by removing or altering whatever it thinks objectionable; the evil results of which proceeding are twofold. First, that beauty deprived of its proper foils and adjuncts ceases to be enjoyed as beauty, just as light deprived of all shadow ceases to be enjoyed as light. A white canvas cannot produce an effect of sunshine; the painter must darken it in some places before he can make it look luminous in others; nor can an uninterrupted succession of beauty produce the true effect of beauty; it must be foiled by inferiority before its own power can be developed. Nature has, for the most part, mingled her inferior and noble elements as she mingles sunshine and shade, giving due use and influence to both; and the painter who chooses to remove shadow perishes in the burning desert he has created. The truly high and beautiful art of Angelico is continually refreshed and strengthened by his frank portraiture of the most ordinary features of his brother monks, and of the recorded peculiarities of ungainly sanctity; but the modern German and Raphaelesque schools lose all honour and nobleness in barber-like admiration of handsome faces, and have in fact no real faith except in straight noses and curled hair. Paul Veronese opposes the dwarf to the soldier, and the negress to the queen. Shakespeare places Caliban beside Miranda, and Antolycus beside Perdita; but the vulgar idealist withdraws his beauty to the safety of the saloon, and his innocence to the seclusion of the cloister; he pretends he does this in delicacy of choice and purity of sentiment, while in truth he has neither courage to front the monster, nor wit enough to furnish the knave."

I do think that the time has arrived when photographers would do well to put aside for a time processes, and carefully study the writings and works of painters and art writers; for that little has been done in this direction, except by the few, is at once apparent on an examination of the mass of photographic productions; and the chief characteristic which strikes the eye on looking over a number of photographs, especially if they be portraits, is the almost general absence of taste which they display. Now undoubtedly if photographers were carefully to study the writings of such men as Ruskin, Burnet, Twining, Leslie, and others, there would be opened up to them a new field of thought which would at once bring forth fruit in their photographic productions.

Twining, on the subject of art-knowledge, in his preface says, "Writers on art who do not confine their views to one particular school or country, but admit its influence as cultivated by different nations, may sometimes contribute effectually to dispel prejudiced, exclusive, and one-sided ideas; for the more art is generalized, the less likely is it to fall into a condition of self-sufficiency which discovers beauties in that method only of interpreting nature to which the eye has been long accustomed, and the mind gradually trained. Its influence will ever become more beneficial in proportion to the extent to which it diffuses kindred tastes and feelings among various nations.

"Doubts have been continually raised as to the expediency of rules and principles as applied to art; but have those who entertain such doubts well considered if there be any cases at all to which rules may be applied, and if so, to what extent they may be made available? Let the question be entered into, and precise limits assigned to the use or withholding of rule, and I believe that few minds at all conversant with art would maintain any further doubts as to the utility, and indeed the occasional necessity, of guiding principles. Even in science, practice is sometimes placed by the ignorant above theory, because practice realizes the immediate and visible result; but without theory, without the first application of the principles of force and motion, what would practical skill have to act upon, and what results could the greatest manual dexterity produce? Very different, however, are the limits assignable to theory in mechanical sciences and in art. Rules, as it has been generally admitted, are no substitutes for genius. They would never have produced the 'Galatea,' the 'Transfiguration,' or the 'School of Athens.' * * * * Theory, indeed, would be worse than useless in the art of painting were it to claim as its special office to rule inspired thought, and to assert principles of grace in the lively creations of fancy. Its advantages are chiefly shown in correcting errors, and in chastening the productions of those who want penetration and experience necessary to proceed unguided. A more extended knowledge of the principles on which art is founded might not add many to the best of the yearly productions of our artists, though it might diminish immensely the number of the inferior ones. * * * * * * What do we perceive if we examine the usual course of the progress made by any individual in art? From the earliest (I may say infantine) attempts at drawing we may trace a change in the ideas entertained with regard to imitation, which is commensurate with the progress of the performer, and which certainly cannot be due to the exercise of the hand alone. The child and the uninstructed in art seem alike to consider it of the greatest importance to omit nothing which they are able to see. Continuity of formappears to them a point of first necessity. A boundary line, studiously even an unbroken, of an object so situated as to afford the fullest view, is deemed the best and most natural expression of it. * * * * * * The third stage in art is that in which sentiment and feeling are the predominating principles. An ingenuous love for the beautiful in Nature here supersedes the happiest results of tuition; and the work of art which so overflows with the sentiment infused into it, that the spectator becomes a necessary sharer in those emotions, is raised to the most honourable station. But it is in this most delicate period of the art that those resources which are the result of long experience and practice are most required. Their deficiency causes the language of inspiration to be intelligible to the performer only, and their neglect converts the brightest images of the fancy into wild and disconnected abortions."

The History of Alkaline Development.

The following letter from Mr. T. M. Leahy' addressed to the editors of the 'British Journal,' gives the writer's account of his discovery of the alkaline method of development. It will be seen that the opinion we have always maintained, that Mr. Leahy was the *first* discoverer of this process, is correct.

To the Editors.

Gentlemen,—I was rather surprised at the contents of a leading article in your issue of 27th October last, entitled "*Alkaline Development: some Facts in its History,*" and which I must take the liberty of saying does not present an accurate statement of the facts. In that article you claim for the late Mr. Glover and Major Russell the discovery of alkaline development, and after pronouncing judgment against my claims, declare judicially "that Mr. Leahy and his friends are out of court."

As I cannot allow that decision to pass unquestioned, permit me to say that the development of the pictures on tannin plates, which Mr. Glover noticed, occurred in mere exceptional cases, and could not be relied on as a *certain* method, as is proved by the fact that fuming with ammonia, both before and *after* exposure, was extensively practised in America long before Mr. Glover's experiments, and, if development was a necessary consequence of fuming *after* exposure, it could not fail of being noticed and turned to account long previously. I maintain (as an essential condition to the success of the process, and this Mr. Glover seems not to have discovered) that unless moisture be present no development will take place; consequently, by adopting Mr. Glover's method, fuming would in such a case be only a chance sort of development, depending on the hygrometric condition of the collodion film. The distinction here is, that while *his* method was *uncertain* in its result, *my* mode with *solution* of ammonia should *always* succeed. So much for Mr. Glover.

Now, as to Major Russell: I cannot understand why you put his claim before mine; for, in my opinion, his method can hardly be styled *alkaline* development at all, for pyrogallic acid will develope a picture on a dry plate (no matter how prepared) without the addition of ammonia, which merely accelerates the action of the pyrogallic acid. You might as well say that M. Claudet was the discoverer of pyrogallic acid development, because he found that its action was improved by the addition of formic acid.

My letter to the editor of the 'Photographic News' on the subject of ammonia development, was written and posted on the 23rd October, 1862; the editor stated it was in type on the 31st October, and it was published in that journal on the 7th November, 1862. It was not an echo, as you say, of Mr. Glover's communication, for at that time I had never seen nor heard of his published letter, and it has since appeared that his mode of development was not identical with either mine or Major Russell's.

Major Russell's account of his discovery (which must, strictly speaking, be called a modified pyrogallic-acid development) was published on the 15th November, 1862, *fifteen* days *after* my communication was acknowledged to be *in type*, and *eight* days *after mine was before the public.* In the face of this *fact* how can you state that Major Russell's "discovery" was the next step to Mr. Glover's, or that the discovery of the developing property of *liquid* ammonia was due to him?

Again, in a letter dated 16th December, 1862, and published in the 'Photographic News' on the 2nd of January, 1863, I showed that *ammonia,* with the addition of tannin, would develope a picture on a dry plate prepared by *any process,* and that ammonia *alone* would have no effect on dry plates other than tannin ones; so that up to that period (with the exception of Mr. Glover's experiments) I must be considered (as far as published accounts establish the fact) to be the only one who did really follow up the subject of alkaline development, properly so called.

As to the development by aid of carbonate of soda, of which you give the credit of discovery to Mr. Sutton, by your own showing his method of using it was published in September 1863. I beg to repeat, what I have already stated in a letter published in your Journal on the 23rd December, 1864, that I had mentioned the developing properties of carbonate of soda on tannin plates, and in combination with tannin upon any dry plate, in the before-mentioned letter, published in the 'Photographic News' on the 2nd January, 1863, *seven months before* Mr. Sutton made his so-called discovery. Mr. Sutton's developer was only another modification of the pyrogallic-acid method, and to which my communication, as to the developing property of soda in combination with tannin, would be an indication.

Your correspondent, "Georgos," must be a very careless or a very recent reader of photographic journals, when he says that he never heard of my name in connexion with alkaline development until the last few months.

I cannot help saying it appears to me that from the very first 'The British Journal of Photography' has strenuously endeavoured to put my just claims to the discovery of alkaline development in the shade, from what cause I know not, unless it arise from a wish to confine the merit of it (if possible) to its own contributors.

The cause of my not noticing this matter sooner is that, being some time absent from home, I did not see the photographic journals for the last three or four months until yesterday. Requesting, as a matter of fair play, the insertion of this letter in your Journal at your earliest convenience. THOMAS M. LEAHY.

REVIEW.

The British Journal Photographic Almanac. Edited by J. TRAIL TAYLOR. H. Greenwood, 2 York Street.

THE present number of the 'Photographer's Daily Companion' has been issued this year under an improved form and with additional recommendations. Besides the calendar and the usual information respecting the different photographic societies, it contains a very ample list of the officers and councils of various other scientific societies, whose pursuits are of an allied nature to our own art.

A summary of events of the past year is followed by some highly valuable papers on photographic processes. "The Collodio-Albumen, or Taupenot's Process," by H. Petschler, photographers who require the aid of dry plates will do well to study in conjunction with the "Fothergill Process," by W. Ackland. Each has its peculiar merits; and we believe that, by an adherence to the rules laid down, a satisfactory degree of result must follow, and prove to them far more agreeable than relying on ever-varying experiments with the tannin process, to which, represented as excellent and almost perfect one month, the next we are assured that certain other requisites are needful in order to obtain satisfactory results.

"The Collodio-Bromide, or Silver Process, without a Nitrate Bath," by Mr. B. J. Sayce, is fully detailed, as are also the Malt Process, the Ivorytype, the Ebeneum, the Calotype, and others. We believe still that the old Calotype process is destined to be fully revived, and that it contains, under careful manipulation, certainty of success, combined with a facility of operation and a portability in use which are very pleasant to those who have toiled in vain to secure pictures under more complicated arrangements.

On the optics of photography Mr. Shadbolt again appears before the public.

"The various Processes of Printing," are given in detail. "Some Observations on Photography in the Field," must be read with attention.

A carefully condensed history of pre-journalistic photography, taken from the Patent-Office records, together with a collection of useful tables of weights and measures, completes one of the most useful volumes we have ever perused.

International Exhibition of Portugal.—This Exhibition, held at Oporto, was closed with great ceremony by the King in person early this month. Medals were awarded, but much more sparingly than has been usual at Exhibitions of this kind, thus enhancing their value to a great extent. We are glad to find that a medal has been gained by an Englishman in the photographic department, and has been awarded to Mr. Netterville Briggs, of Leamington, who succeeded to the business of Mr. H. P. Robinson.

Compliment to Photography.—We learn with pleasure that the Hobart College and Genoa Medical College, New York, have just conferred on our esteemed *confrère*, Mr. Wharton Simpson, the honorary degree of M.A. This honour to photography, which is as well deserved as it was quite unsought, will be, we doubt not, appreciated by our readers, as few Members of the Society have contributed more liberally to the advancement of the art than G. Wharton Simpson, M.A.

French International Exhibition, 1867.—We especially call the attention of our readers to the fact that the last day in this month is the last day for making application for space, and should this be neglected, in all probability disappointment will ensue to the applicant. We know that the demands for room are unprecedentedly numerous.

NOTICE.—With the next Number will be issued the index and title-page of the present volume, with a corrected list of the Officers, Council, and Members of the Society, together with the Rules.

Some Correspondents shall receive an early answer by letter.

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